

# THE IRON AGE

New York, May 8, 1919

ESTABLISHED 1855

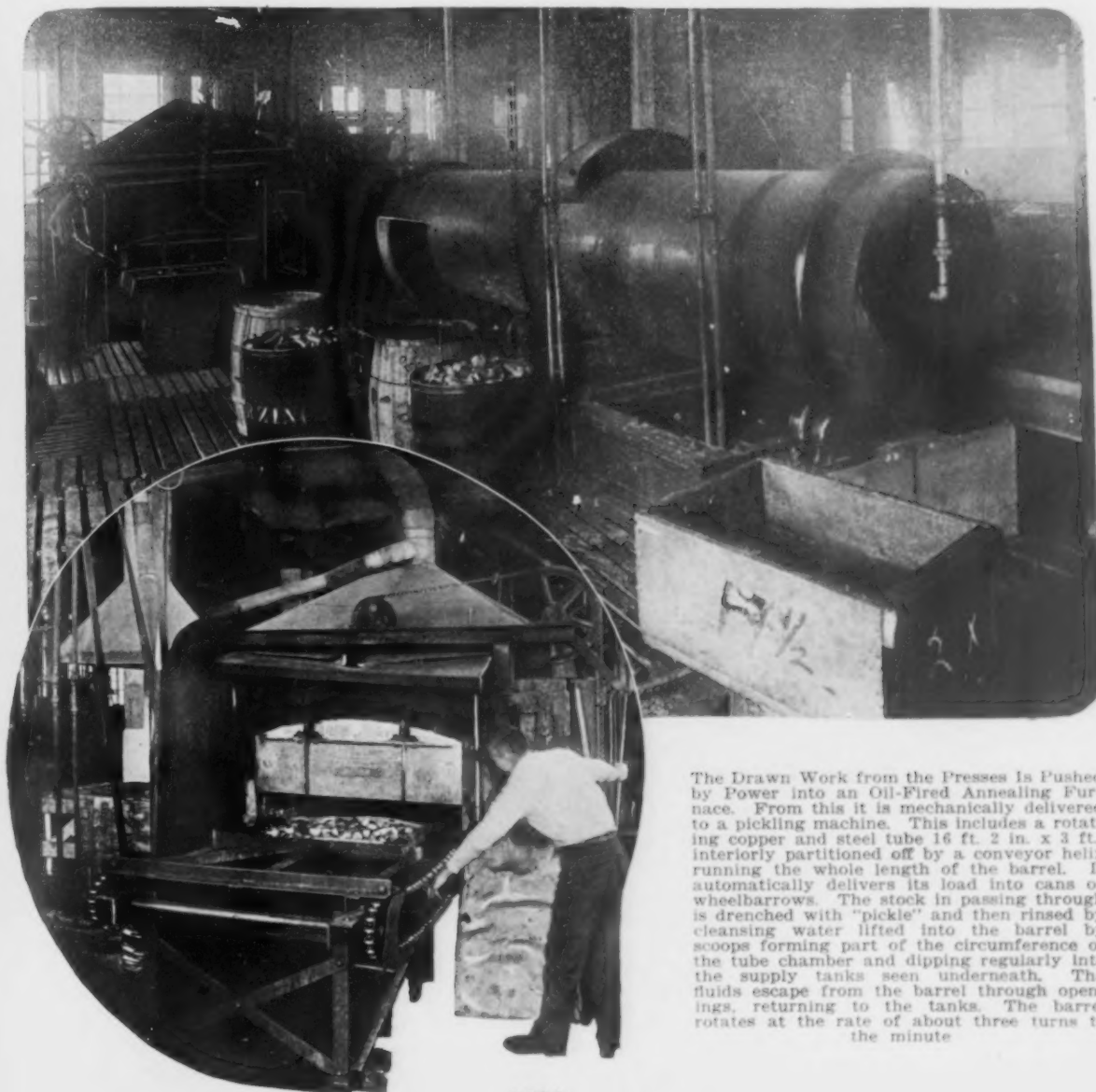
VOL. 103: No. 19

## Manufacturing Non-Ferrous Metal Articles

Annealing and Pickling Machinery and Automatic Safety Devices in Plant of Bridgeport Metal Goods Mfg. Co.—Simple Costkeeping System

ORGANIZED in 1909, the Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn., began the erection of its plant in 1916 and commenced operations there in the early part of 1917. To-day some 600 employees are at work in the plant, which comprises three manufacturing branches, the main factory buildings, at Cherry and Auburn streets, and two other departments housed elsewhere in Bridgeport within three-story structures entirely devoted to the use of this company and engaged upon special war work and on dry battery manufacture respectively.

Among the specialties manufactured by the company there is a line of flashlights, comprising many kinds and sizes, in a variety of plated and enameled metal finishes. Some automobile accessories are also made, such as pumps, carbon removers, etc. Among war contracts, it is of much interest to note that this company manufactured some 150,000,000 of the latest design of bullet brought out by the French Government. This bullet, named after its inventor, the Label, is of bronze, swaged to shape, and has a finished diameter of 8 mm., a trifle less than 1/3 in.



The Drawn Work from the Presses is Pushed by Power into an Oil-Fired Annealing Furnace. From this it is mechanically delivered to a pickling machine. This includes a rotating copper and steel tube 16 ft. 2 in. x 3 ft., interiorly partitioned off by a conveyor helix running the whole length of the barrel. It automatically delivers its load into cans or wheelbarrows. The stock in passing through is drenched with "pickle" and then rinsed by cleansing water lifted into the barrel by scoops forming part of the circumference of the tube chamber and dipping regularly into the supply tanks seen underneath. The fluids escape from the barrel through openings, returning to the tanks. The barrel rotates at the rate of about three turns to the minute.

Work for the trade is done by the company in various metals and alloys, including cupronickel and zinc. The latter material, which is usually classed among the ductile and workable things, is, nevertheless, not so tough of tensile strength as to be an easy proposition for the inexperienced to use for press-drawn purposes. It is freely manipulated by the workmen at this factory and ferrules and "cups" of all shapes and sizes are drawn.

The promoters and present management of the company held executive positions for years in the production of similar lines of manufacturing, and the plans for the buildings, the working out of the site possibilities and the methods employed in factory output were based on prior study. A. S. Lyhne is president of the company and H. K. Beach is secretary-treasurer. To take care of expansion a single story extension, a part of the first floor of a four-story building, has a roof which is practically the weather-protected floor of another story yet to come. Furthermore, the site is laid out with a complete plan for manufacturing and other buildings to cover its entire area. When buildings are erected, as from time to time they may be built for emergency purposes, they are from the outset dealt with as temporary only and are of suitable frame construction to this end.

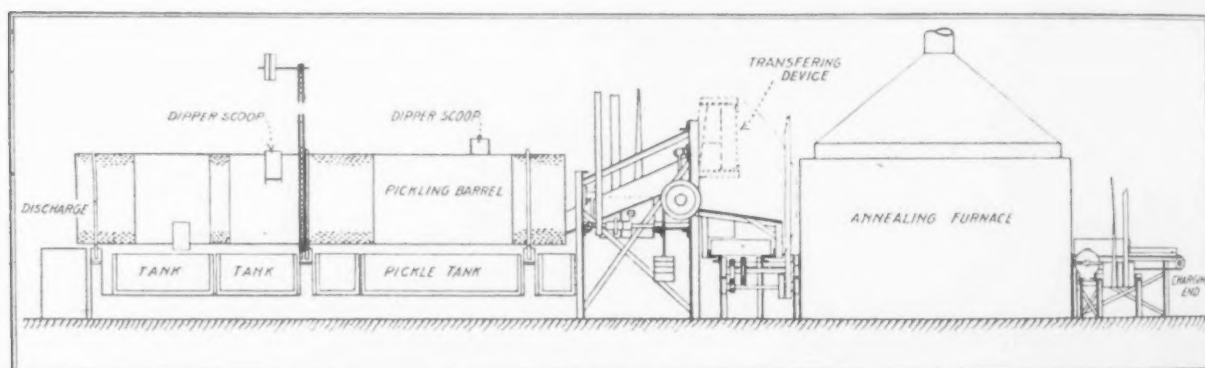
A consistent and a progressive scheme for growth and for the convenient housing of the busi-

On the first floor are the heavy press rooms and annealing and cutting departments. A tool vault extends through the various stories from the ground floor. The office on the second floor has one large room lighted on three sides for executive officials and clerks. On this floor is the toolroom equipment, which in a plant of this sort is necessarily elaborate and complete. Light machinery, such as the array of footpresses, are on the third story.

The factory type of building construction is of brick design with spacious depths between floors and having large window areas. Typical distances between floor surfaces vertically are 13 ft. 6 in. first story, 14 ft. 2½ in. each for second and third stories and 15 ft. 7½ in. for top story, measuring from flooring to roof apex and 13 ft. 11¾ in. at lowest roofing line.

A typical first floor is laid on 6 in., 1 to 6, cinder concrete, supporting chestnut sleepers 13 x 4 x 4 in., spaced 24 in. center to center. Over the concrete is spread a cushion of ½-in. sand tar. Next comes a flooring of 2-in. North Carolina pine, topped by ¾-in. factory maple, laid diagonally. Upper floors have ¾-in. factory maple laid on 4-in. North Carolina flooring, separated by ¾-in. diagonal boxboard, the whole resting on beams of 14 x 16-in. long leaf yellow pine.

Floors are supported by a double row of 14 x 14-in. long leaf yellow pine columns on first



The Pickling Barrel Is Offset with Respect to the Furnace So That the Annealed Product May Be Conveniently Recovered If Pickling Machine Is Not in Operation

ness as it grew was prepared in advance. There is every likelihood that the idea and its clothing will fit each other until the full resources of the site are exhausted. These are the easier of development because of the free access obtained by the factory to the surrounding streets. Whatever the development may be of the manufacturing organization, there is ready approach for all teaming, and the main tracks of the New York, New Haven & Hartford Railroad trunk line being nearby provide excellent shipping facilities. Adjacent to the neighborhood is the water front of Bridgeport, providing a footing for transportation facilities up and down the storm-sheltered Long Island Sound and out upon the Atlantic Ocean.

The general course of factory operations is for the incoming materials to enter on the ground floor and there to be fed to the heavier machines and thence travel upward for lighter operations, being finally inspected and packed on the top story. Offices are on the second floor, as this gives all necessary privacy and yet permits the use of the largest possible windows of clear plate-glass. A second floor office also allows free access to the several manufacturing departments with a minimum of stair climbing.

story, 12 x 12-in. on second, 10 x 10-in. on third and 8 x 8 in. on fourth. In center aisle of building these are spaced transversely 19 ft. ¾ in. center to center, spaces on either side being 18 ft. 9⅝ in. from walls to center of columns. The columns are spaced longitudinally at 9 ft. 10½ in. center to center. Columns are connected by cast-iron plates at footings with a bearing of concrete 1 ft. 6 in. deep by 5 ft. 3 in. x 5 ft. 3 in.

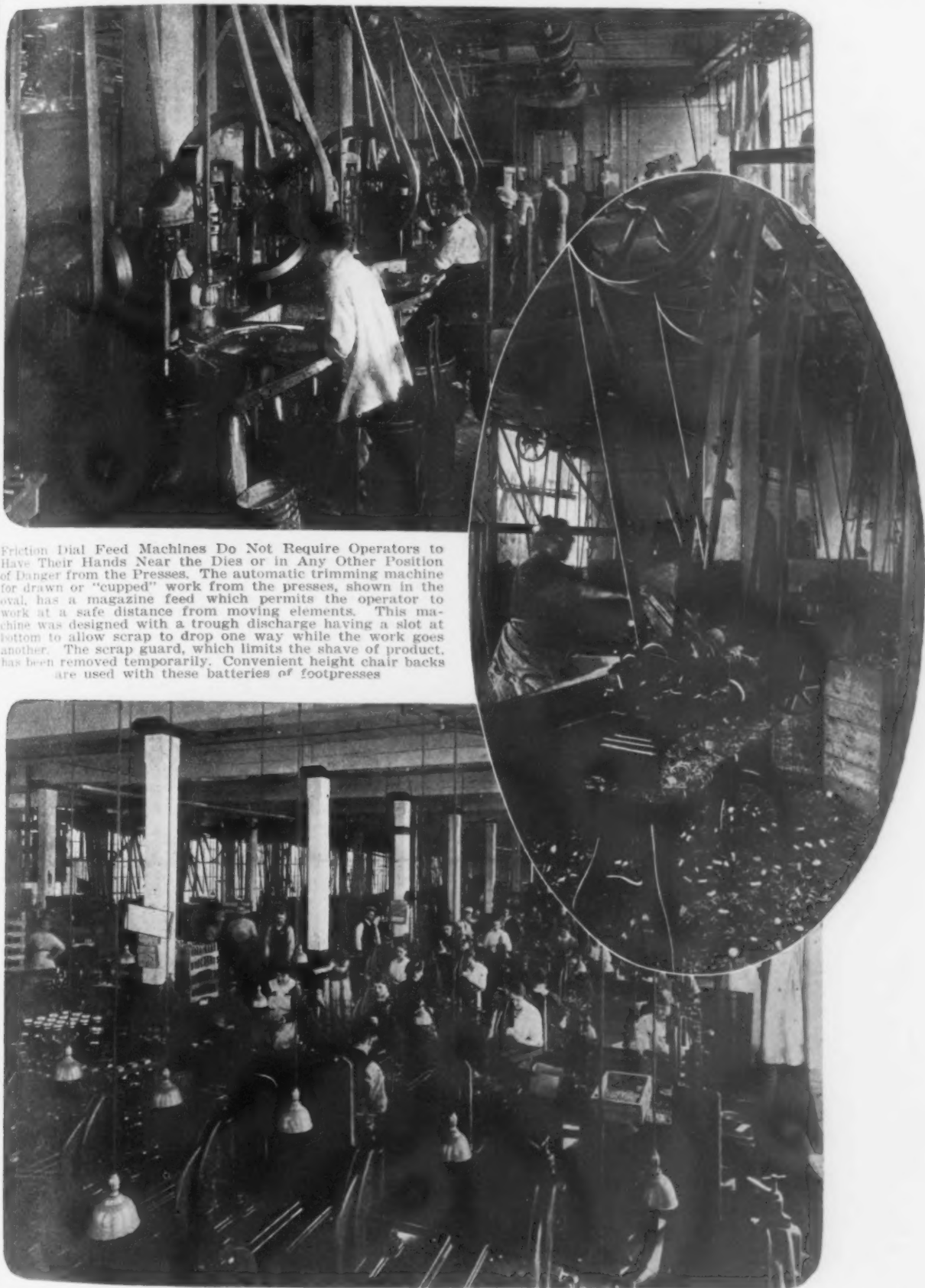
Windows come to within 3 ft. 4 in. of the floor and extend to a level with the ceiling line. The steel sash on all floors fits 13½ x 20-in. glass. Windows are 7½ ft. wide in the clear. Elevator well, stairways and factory are separated by very substantial fire walls, and there is a thorough-going sprinkler system installed.

Buffing and polishing operations, as well as plating work and lacquering are housed on the fourth story. Special exhausts are attached to all polishing heads. The floor is kept free of debris and all work is moved, boxed or on special trays, in a compact and convenient way. Lacquered work dries in metal cupboards with close-fitting doors, and in this department, as in the plating room, there are spacious overhead trunks to carry away the fumes and odors that are unavoidably developed in doing this work, but which can be

in the main removed to the very great advantage of all employed in the neighborhood of their production.

The accompanying reproductions of photographs show the free employment of electric

each. Motors are slung from the ceilings near the line shafts they drive. Connections are made between motors and line shafting by chain drives. This method even at the high speeds of direct drive from the motors is spoken of with praise



Friction Dial Feed Machines Do Not Require Operators to Have Their Hands Near the Dies or in Any Other Position of Danger from the Presses. The automatic trimming machine for drawn or "cupped" work from the presses, shown in the oval, has a magazine feed which permits the operator to work at a safe distance from moving elements. This machine was designed with a trough discharge having a slot at bottom to allow scrap to drop one way while the work goes another. The scrap guard, which limits the shave of product, has been removed temporarily. Convenient height chair backs are used with these batteries of footpresses

power, which is purchased from the local commercial producer, and is in the form of a 3-phase, 60-cycle alternating current. About 30 electric motors are distributed about the plant for group driving of some thousand machines. These motors are of three sizes in sets of 20 and 35 and 50 hp.

and satisfaction. The driving chains are thoroughly protected from air-floated grit or any other danger to their constant effectiveness, a tight metal casing enclosing the entire drive in every instance.

A hospital is provided in the building, but

every precaution is taken to avoid the possibility of accidents. The frictional dial feed for presses devised when Mr. Lyhne was in the employ of another company is not only a speed-promoting device in itself, but for that class of operations makes the press so equipped harmless while the operator is busy at work. The stock placed upon the disk or dial rotating away from the worker, slides the pieces between two converging metal strips that guide them orderly one at a time under the plunger of the press and thus permit very rapid action. Of course the work must be short in proportion to its diameter, so it will "stand on its feet" when being urged by the dial toward the die.

A similarly safe tool is the automatic trimming or beading machine, for it is employed for

finger carries the shell ahead, where a plunger pushes it upon an arbor. Then while the shell is accurately held against a shoulder or stop, a rotary cutter sweeps down against it and while the supporting arbor, the shell and the cutter rotate in contact the scrap is trimmed cleanly from the shell edges or rim. At this stage it is automatically stripped off the arbor to fall into a trough having a slot along the bottom for the scrap to go clear while the shell rolls onward to drop into a receiving barrel.

The annealing furnace and the pickling barrel are remarkable for other features than mere size, though this is striking, the combination extending a length of 35 ft. Annealing trays containing the work are laid upon an apron in front of the furnace doors and pushed by power into the oil.

**Form A: EMPLOYMENT**

Name \_\_\_\_\_ Dept. \_\_\_\_\_  
 Address \_\_\_\_\_  
 Date \_\_\_\_\_

**Form B: EXPENSE**

MAN NO. \_\_\_\_\_ DATE \_\_\_\_\_ 191 \_\_\_\_\_ DEPT. \_\_\_\_\_  
 NAME \_\_\_\_\_ ORDER NO. \_\_\_\_\_  
 DESCRIPTION OF WORK \_\_\_\_\_  
 FOR DEPT. NO. \_\_\_\_\_  
 MACH. NO. \_\_\_\_\_  
 REGISTER NO. \_\_\_\_\_

1	2	3	4	5	6	7	8	9	10	11	12	DAY
1	2	3	4	5	6	7	8	9	10	11	12	DAY

**Form C: SPOILED WORK**

Order No. \_\_\_\_\_ Dept. \_\_\_\_\_ Date \_\_\_\_\_ Reg. No. \_\_\_\_\_  
 Lbs. \_\_\_\_\_ Cust. \_\_\_\_\_  
 Pces. to lb. \_\_\_\_\_ Article \_\_\_\_\_  
 Pces. \_\_\_\_\_ Last Operation \_\_\_\_\_

**Form D: DIRECT SUPPLY**

M \_\_\_\_\_ D. S. \_\_\_\_\_ F. S. \_\_\_\_\_ L. A. B. \_\_\_\_\_  
 Total Cost \_\_\_\_\_

**Form E: TRANSFER TICKET**

DATE \_\_\_\_\_ RES. NO. \_\_\_\_\_ ORDER NO. \_\_\_\_\_  
 NAME \_\_\_\_\_  
 ARTICLE \_\_\_\_\_  
 LBS. \_\_\_\_\_ PICES/LB. \_\_\_\_\_ PICES \_\_\_\_\_  
 DEPT. NO. \_\_\_\_\_ TO DEPT. NO. \_\_\_\_\_

**Form F: TIME TICKET**

MAN NO. \_\_\_\_\_ DATE \_\_\_\_\_ 191 \_\_\_\_\_ DEPT. \_\_\_\_\_  
 NAME \_\_\_\_\_ ORDER NO. \_\_\_\_\_  
 DESCRIPTION OF WORK \_\_\_\_\_  
 FOR DEPT. NO. \_\_\_\_\_  
 MACH. NO. \_\_\_\_\_  
 REGISTER NO. \_\_\_\_\_

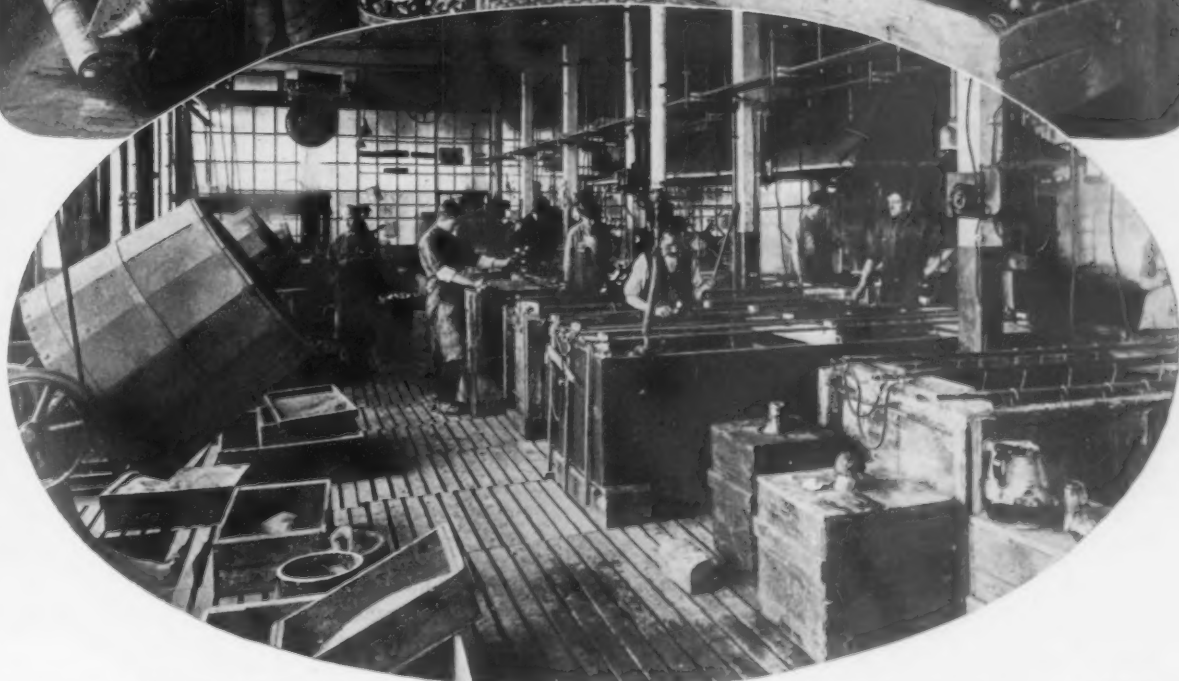
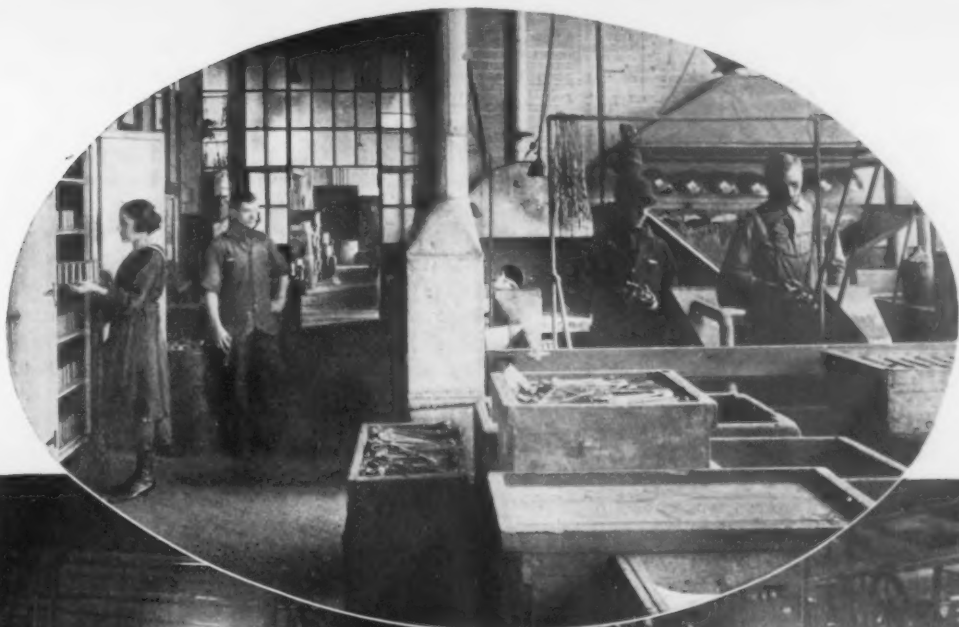
1	2	3	4	5	6	7	8	9	10	11	12	DAY
1	2	3	4	5	6	7	8	9	10	11	12	DAY

SOME OF THE FORMS USED IN THE FACTORY OF THE BRIDGEPORT METAL GOODS MFG. CO.

A—Employment index card for filing; size of blank, 2 1/4 x 5 in.; color, buff. B—Expense time ticket, posted every day on standing order number assigned to each foreman; size of blank, 4 x 6 in.; color, white. C—Excess cost report, "change factory cost"; this is received daily; size of blank, 4 x 6 in.; color, yellow. D—Record of spoiled work which is charged monthly into general expense. The initials indicate M for material; D. S. for direct supply; F. S. for factory supplies; L. A. B. for labor; direct supply might be brass or steel, while factory supplies may be plating necessities, etc.; size of blank, 5 x 8 in.; color, white. E—Transfer ticket; this travels with the work from one department to another; size of blank, 4 x 6 in.; color, salmon. F—Time ticket for a production order; size of blank, 4 x 6 in.; color, brown.

both purposes. All the operator does is to keep the magazine pocket supplied with the pieces for trimming or beading, as the case may be. When the blank, cup or ferrule gets down to the bottom of the magazine chamber in its turn, a machine

fired furnace as soon as the door is raised for that purpose. An advantage over having the trays carried into the furnace or drawn inward by any mechanical means is that such agencies are so frequently subject to a destructive heat



The Plating Department Floor, Shown in Top View, Is Gridded Over with Narrow Lengths of Boarding to Keep It as Dry as Possible  
In the Polishing and Buffing Equipment, Shown in the Middle View, the Covers on Sides of the Polishing Head Are Swung Back in Making a Change of Wheels. Workmen at the bench are stringing upon rods circular work to be automatically polished or buffed on the wide formed wheels behind them  
The Lacquering Room Is Particularly Noteworthy for the Effective Exhaust Ducts and Trunks for the Removal of the Fumes

that damage sooner or later results and repairs are too often required. Pushing in the boxes or trays keeps the propelling medium clear of the fire to the benefit of everybody and everything concerned.

At the exit end of the furnace there is a receiving apron to transfer the tray of work to the pickling barrel or to discharge it otherwise, the offset connection of furnace and pickling barrel permitting either procedure to be followed at

pleasure as the nature of the work demands. A balanced tilting device tips up the tray and discharges its contents smoothly into the receiving end of the pickling barrel. The interior of this has a conveying helix or partition dividing up the space from end to end. As the barrel rotates slowly, say about three revolutions to the minute being the normal rate of drive, the work slides along the conveyor chamber and is thoroughly drenched with the pickle scooped up by the hollow arms of the barrel from the supply tanks seen underneath the machine. Of course, the pickle travels with the work to a point when it escapes through perforations in the zone of the barrel at that place and falls back into its own tank.

Further on the work is washed thoroughly by an entering flood of water scooped up in like manner from another supply tank, provision being made in this case also for the escape of the fluid after it has served its purpose and without troubling or interfering in any way with the contents of the other tanks or the other half of the pickling barrel. The latter is supported on roller bearings at a height sufficient to bring the discharge end high enough to deliver the contents into a factory receiving can or into a wheelbarrow as may be desired in routing the annealed and pickled work. Of course, the pickle or acid-holding end of the barrel is made of copper, while the other end for water carrying is of steel.

Books of accounting are closed monthly, and it

is then practicable for the officials of the company to know exactly where they stand on a financial basis. Every Wednesday morning a committee of managers assembles and has all the figures of the scrap, etc., for the previous week. The closest possible check is kept on the company's use of time and materials.

The employment record of the worker gives a useful line on the various pointers of service as in trying an individual on a new job or fitting him to an old one. Of the other forms it may be said that an exact record is received every day by the office of all work done by each department.

A recapitulation sheet or analysis report is posted up daily in the office from the department records as they are sent in from factory, the showing being completed every day to keep up with the progress of operations under the various foremen. Not only is it most important to keep accurate account of scrap, but it is also equally of consequence to know and profit by the records of the various operations done on the spoiled work before it reached the stage where it was scrapped. This is done by enumerating the operations in a printed list on suitable blanks and checking them accordingly. Excess cost sheets are also used to follow on the heels of every job that shows any indication of stopping short of a profit-making stage. What the estimator hopes is not always what the cost clerk finds.

### Chain Making in Australia

WASHINGTON, May 6.—Australia is to have a chain-making industry, according to a report from Trade Commissioner A. W. Ferrin, at Melbourne. The decision of the Commonwealth Government that material required in connection with its local shipbuilding scheme should be obtained as far as possible in Australia, he writes, has induced H. Williams & Co., of Brunswick, to enter upon the industry of chain making, which hitherto has not been attempted in the Commonwealth. Special plant was installed for the purpose, and on Feb. 6, 1919, the Director of Shipbuilding visited the works to witness the testing of the first output, comprising eight 90-ft. lengths of 1½-in. mooring chain, required for the dredge *Pioneer*. This class of chain has to be tested up to a strain of 28 tons 5 hundred-weight, and an hydraulic plant capable of testing up to 560 tons has been put down by the firm. The director expressed himself as highly satisfied with both the manufacture and the testing of the chain. Williams & Co. are engaged in the manufacture of 1½-in. ship's steering chain as well as crane chain, and engineers of the Harbor Trust have announced complete satisfaction with the work done. Australian newspapers express the hope that a very extensive industry has been started.

### Swedish Iron Trade Hard Hit

Stagnation in the iron and steel trade of Sweden is one effect of the armistice. The London *Ironmonger* has the following:

"The manufacture of iron and steel—Sweden's principal industry—has been brought almost to a standstill owing to the circumstance that its three great customers have ceased to buy. Supplies to Germany stopped before the armistice was signed. There is no prospect of an early resumption of the trade, and American buying has fallen to a negligible quantity. While admitting a small quantity of steel, the importation into this country of Swedish iron is prohibited almost entirely, and there are in England stocks sufficient, it is believed, to last probably a couple of years, for the reason that during the war the British users discovered efficient substitutes for Swedish material

for a number of purposes and are well satisfied with them. As Sweden exported far more iron products than she has consumed at home, thousands of workmen in that country are wholly or partly unemployed and becoming turbulent, and strikes are frequent in the minor trades. The fact that Sweden made more money out of the war conditions relatively than any other country, and that it possesses abundance of money, only makes matters worse, because the gains have mostly gone into pockets already well lined. Prices of necessities and rates of wages rose more in Sweden during the war than in Great Britain, and while the former remain high opportunities to earn wages have been largely reduced. The present threatening attitude toward the employing and official classes by the workers is the result to some extent of disgust with the former for their active sympathy with Germany in its brutal attempt to dominate Europe.

"The stocks in the hands of the British Government referred to above consist of 80,000 tons of Swedish pig, as well as 15,000 tons of Swedish bar iron, most of the latter being such as is used for making the best qualities of crucible steel."

### Scrapping German Submarines

WASHINGTON, May 6.—"Scrapped" German submarines have a breakup value of about \$12,000, according to an interesting report sent by Vice-Consul Bernard F. Hale, Swansea, Wales.

"Considerable importance," he says, "is attached to the recent purchase of 25 German submarines by Messrs. G. Cohen Sons & Co., of London and Swansea, who will undertake to break up these vessels and dispose of the scrap metal.

"This firm is a large ship-breaking company, and during the war handled considerable quantities of scrap iron brought over from the battlefields of France. It recently purchased at auction 25 German submarines, 12 of which it intends to bring to its works in Swansea. It is estimated that the breaking up value of each vessel will be \$12,166 and for the dozen, \$145,995. The work on each submarine will occupy 10 weeks, and considerable additional labor will be employed by the company. The scrap metal thus obtained will be sold to the various tinplate and steel mills in this district.

# Hot Deformation and the Quality of Steel

## Effect of More or Less Work on Properties—Forging and Rolling Contrasted—Results of the Use of Different Hammers

**A**N important discussion on the effect of hot deformation on the quality of steel took place at the fall meeting of the Iron and Steel Institute in London after Georges Charpy of Paris had presented his paper "Influence of Hot Deformation on the Qualities of Steel." An abstract of this paper was published in *THE IRON AGE*, April 24. In the discussion referred to, some of the prominent steel makers and metallurgists in England took part and a surprising contention was that the more work that is put on steel, the worse it becomes. An abstract of the discussion, as reported by the *London Iron and Coal Trades Review*, follows:

### Much Work Has Bad Effect

Dr. J. E. Stead said that for generations engineers and others had always assumed that the more work put upon steel the better it was. Georges Charpy now says that this is not so in every case; that in cross-sections the more work put on the steel the worse it became. Dr. Stead's own work, extending over a great many years, had practically confirmed the author's results. Years ago, when he had many rails to test and examine, he made a point of cutting sections from the heads, and then placing them over a V-block and striking them on one side. Except in the case of very pure metal they all broke off suddenly, almost like cast iron, without deflecting more than 5 or 6 deg. He found, however, that that peculiarity depended very largely upon the amount of non-metallic inclusions present.

Judging from the remarks of the author, and also from observations generally in his own work, it might be concluded, he said, that the purest steel castings when initially sound and perfectly made and heat-treated were equal physically in every direction. In proportion as the non-metallic inclusions increased, bend tests indicated proportional weakness in all directions. In cast material, after extensions by hot rolling, the less the amount of non-metallic inclusions the better the steel in the cross direction; the higher the proportion of the inclusions, the worse would be the bending properties in that direction.

The worst case of weakness in the cross direction he found in wrought irons. The purest and best Yorkshire wrought irons when cut through in cross-section and struck with a hammer broke off, bending only about 5 deg. before suddenly snapping. The higher the sulphides and inclusions, the more closely the properties of steel approached those of wrought iron, and the cross fractures resembled each other in appearance. The quality was not at all deteriorated in the longitudinal direction, but in proportion as the sulphide of manganese and non-metallic inclusions were increased, the good qualities were reduced in the cross direction. Commercial billets and steel bars containing from 0.07 to about 0.3 per cent of carbon and 0.07 of sulphur, in  $\frac{1}{2}$ -in. longitudinal sections, all bent to 180 deg., but the cross-sections broke on bending from nothing at all to about 90 deg.

In the very purest material obtainable, he continued, namely, Armco iron, in which there were practically no non-metallic inclusions, it did not matter whether the bars were 2-in. billets or 1-in. squares, the cross and longitudinal sections bent equally well. Comparing that with Lowmoor iron, a marvellous difference would be found.

### Forging and Rolling Contrasted

Incidentally, Dr. Stead said, he would like to refer to the difference in the effect of forging and rolling. When an ingot was rolled out, the whole section was just reduced in size. If it was a 2-ft. ingot, on rolling

down to a 2-in. billet all the sulphide blowhole segregations were exactly in the same relative position as they were in the ingot. When square ingots were forged under the hammer, they were struck first on one side and then at right angles to that side. The steel flowed in four directions, that which flowed sideways causing the steel to bulge outward. On turning the forging at right angles the steel of the "side bulges" was driven toward the central axis and other bulges formed on the sides which had been at first compressed, and in turn these were hammered flat and this continued till a square billet was produced. This treatment caused the annular arrangement of the blowhole segregation in the ingot to be disturbed and to appear in the form of a four-limbed star, in the cross section of the billet, with its limbs pointing to the four corners. He suggested that M. Charpy's paper should have the serious consideration of the engineering standards committee.

### Character, Not the Amount of Work

Cosmo Johns believed that it was not the amount of the work that was done that was the cause of the difficulties that were sometimes experienced; it was rather the character of the work that gave rise to it. In the extension of a large ingot in order to make a hollow forging, it was possible to break up usually the original crystals, but not always possible to succeed in preventing the persistence of the boundaries. Large crystals persisted in a particular direction. It was impossible to do too much work on steel provided the temperature was right, but it was very easy to overwork the steel in the wrong direction. Rolling was perhaps the most convenient but the least efficient way of breaking up the structure; forging and hammering for the smaller pieces and pressing for the large ones, provided the energy available was proportional to the thing being forged, came next. The best of all was some system which could be only applied to small products, where work was done upon the steel in every direction. That was most calculated to give a good structure.

### Effect of Different Sized Hammers

Dr. J. S. Unger, manager, research laboratory Carnegie Steel Co., Pittsburgh, said he was reminded of some specifications that the United States steel makers had to meet at the present time. He had in mind a certain specification in which it was definitely stated that the reduction from the ingot to the finished forging must at least be a ratio of 4 to 1. He was also reminded of a practical example that he experimented with about three years ago in relation to some driving axles for locomotives. One of the railroad companies insisted on having a certain reduction from the ingot to the finished axle. They thought the work that was done by the manufacturer was not sufficient to put it into the most satisfactory physical condition. To demonstrate this they took a bloom about 15 in. square, discarded the top half in order to eliminate any segregated portion, and cut the remainder into three pieces, sending one to each of three firms, who forged them into rounds; at one firm under a 7000-lb. hammer, at another firm under a 15,000-lb. hammer, and at a third firm under a 2000-ton hydraulic press.

A study was made of the effects of the small hammer, the larger hammer, and the 2000-ton press, and of the effects of different reductions of 50 per cent, 40 per cent and 30 per cent. After forging, the pieces were allowed to cool normally in the air, and longitudinal test pieces were taken out of various parts. Much to his surprise he found practically no difference in the physical qualities of the tensile specimens. The work done under the 2000-ton hydraulic press gave a

trifle the best results. He felt that was due to the slower action of the forging press, and that the difference in the results was more particularly due to the finishing temperature than to any effect produced by the working.

Dr. Unger said he had grave doubts as to whether, in a great many cases, the manufacturer was not asked to do more forging than was really necessary. On another occasion he made further experiments, in which he found that if he was able to forge a piece with about 25 per cent reduction, he was able to do as well as if he gave it 50 per cent reduction.

#### Value of the Charpy Notch Tests

Sir Robert Hadfield, referring to the impact tests given in the paper, said he presumed those tests were made on the ordinary Charpy test bars; if so it was important to know whether the tests were made on the large or the small pattern, as Charpy had several types of test bars. They were greatly indebted to the author for the system he had devised of notched-bar tests. He would never forget walking through the great Essen works and research laboratories a year before the war, and noticing that a great deal of the so-called wonderful Krupp advance had been founded on the work of M. Charpy and his notched-bar test experiments. It showed that the metallurgical world was indebted to France rather than Germany in that respect.

#### Possibility of Overforging

Mr. Hadfield said he was very glad to find that the author confirmed the statement he himself made before the last meeting of the institute, namely, that in order to get the highest possible quality it was not necessary to employ extraordinarily large ingots. There was no doubt whatever that by proper heat-treatment and casting and the obtaining of sound smaller ingots or smaller cast billets, just the same results—in fact, he thought on the whole better results—could be obtained than by taking a very large ingot and forging down to a small-size section. In the latter case, especially with harder material, the steel ran considerable risk of being injured in this, what might be termed, overforging.

#### How to Obtain Sound Ingots

Dr. W. H. Hatfield, after saying that if an engineer were reading the paper he might legitimately deduce from it that work upon material was a disadvantage, and that it was far better to take the cast material, remarked that the question was by no means simple, because it was necessary, in the first place, to obtain perfectly sound steel. To obtain a mass of perfectly sound steel it was necessary to have an ingot so shaped that it was wide at the top and narrow at the bottom, with a good refractory head.

#### Sulphur in Steel

At a recent meeting of the institute a long discussion occurred on the question of sulphur in steel, and several very distinguished members of the institute actively encouraged the use of steels with high sulphur contents. Sheffield people who had to produce large masses of steel looked askance at the suggestion. It was clear from the paper that if the sulphur contents were increased there would be much more manganese sulphide present, with the result that the effect to which the author referred would be strongly emphasized. The Sheffield manufacturers, therefore, always insisted on a very low sulphur content in their special steels. Dr. Hatfield said he mentioned that particularly because several gentlemen to whom he had recently spoken had assumed it was quite safe to increase substantially the sulphur content of steel.

#### Change of Shape in Many Directions

Dr. Walter Rosenhain thought the suggestion that the paper might be read to indicate that steel which had not had any work done on it was the best was not a logical one if the paper was read carefully. Cosmo-Johns, however, had suggested that the best result would be obtained if it was worked equally in all directions. If this were done, the net result would be no change of shape or volume at all, and that, of course,

would be impracticable. One found that it was useful to employ changes of shape in as many directions as possible. For instance, in the production of any form of flat material, sheet or plates, if it was possible to roll in two directions and not in one there was a very much greater certainty of securing good tests in both directions of the sheet. In steel practice, cross-rolling was almost universal, but there were other materials in which cross-rolling was the exception rather than the rule, and it was found at once in those cases that, unless cross-rolling was done, a good transverse test was not obtained. That was the case, with one proviso. If the ingot was sufficiently carefully cast, and if the materials were sufficiently pure, then cross-rolling was not necessary.

The lesson to be drawn appeared to be that what they must look for was not only a sound ingot, but an ingot proportioned as nearly as possible to the size and the shape of the object which was to be made, so that the reduction of dimensions should be not only uniform in direction, but should be as nearly equally distributed as possible. If a long, narrow object had to be made, that requirement could not be met, and it was then essential to look after the other factors to which Dr. Hatfield had drawn attention.

#### Iron Ore for German Blast Furnaces

It is announced that the Swedish iron-ore producers who have contracts running with German iron makers until the year 1930 have resolved to secure a revision of the agreements on the ground that the conditions have entirely changed since these were concluded, according to the *London Iron and Coal Trades Review*. The object, it need hardly be said, is the obtaining of higher prices.

The delivery of minette to the Rhenish-Westphalian district has now been permitted by the Allies, the first quantities being the tonnage stored at the Upper Rhenish stores in Strassburg and Kehl. The question concerns 25,000 tons which is to be forwarded by waterway to the Lower Rhenish harbors of the Gütehoffnungshütte and the Friedrich Alfred Hütte, of the Krupp company, and further deliveries are held in prospect by the Allies. The Siegerland Ironstone Syndicate has raised the price of raw ore by 10 marks per ton for the second quarter, and that of calcined in proportion.

The increase in the prices of Siegerland iron ore will naturally compel the Pig Iron Syndicate to raise prices as from April 1. Apart from this fact the syndicate had previously decided to revise quotations for the beginning of the second quarter, when higher railroad rates will come into operation. A meeting of the syndicate has just been held, at which the question was to have been settled. If prices are advanced, as is considered probable, it is expected that the Steel Syndicate will follow the example, and that charges will consequently be put up all along the line.

According to the *London Ironmonger* France agreed to send 250,000 tons of minette ore to Germany in exchange for coal and coke. The *Berliner Tageblatt* complained that so far no supplies have been sent from France, with the result that 30 blast furnaces have been idle, and unless minette ore is quickly forthcoming all the furnaces may have to be blown out. It is alleged that during the final negotiations the president of the French economic commission told the German delegates that they had pledged themselves under a contract to supply coal and coke, but the French on their side only promised to give the best consideration to the question of supplying ore. For many weeks past Germany has been sending 7000 tons of fuel to France every day, and these cars, which might have carried back 8000 tons of ore, went back empty, because the French considerations have not yet been concluded. The situation has been eased within the past few days by the release of minette ore for the Rhenish-Westphalian works being confirmed by the Allied Powers on March 12. The first consignments amount to about 25,000 tons, which, in view of the enormous requirements of the Lower Rhine district, are very small, but the supply of further quantities is promised.

## WELDING BROKEN CRANKSHAFTS

### Correct and Incorrect Methods of Lining Up Broken Parts for Thermit Process

BY J. H. DEPPELER\*

In molding practice, the foundryman has always been bothered by the shrinkage of thin ribs between heavier parallel members and has tried to overcome this in numerous ways, principally by the installation of collapsible forms, or the inclusion of cinder or other material in the mold at this point. In the welding of crankshafts by the thermit process, as also in the welding of many other sections, the thermit welder has encountered much the same difficulty and various means have been suggested for overcoming it.

A crankshaft is being used as an illustration because this difficulty has occurred more frequently in crankshaft welding than in the repair of other parts. The two illustrations show the incorrect and correct methods of lining up the broken sections.

Ordinarily in the welding of the pin journal of the crankshaft, the shaft is revolved in the "V" blocks until the defective pin journal is uppermost, as shown in Fig. 1. The slabs or webs of the crankshaft should be in a vertical plane so that the contraction of the pin journal, which naturally will be along a line somewhat remote to the axis of the main journals, will not in any way be resisted by the sides of the "V" blocks. As stated above, the pin journal is usually uppermost, and where the webs are relatively close together, as in the shaft shown in Fig. 1, the contraction of the weld in the pin journal cannot possibly take place, due to the resistance of the molding material between the slabs.

\*Chief engineer Metal & Thermit Corporation, New York.

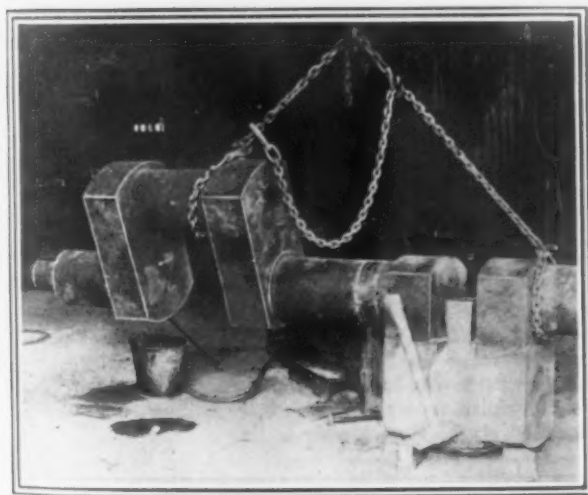


Fig. 2—Correct Method of Lining Up Broken Crankshafts. Pin Journal Welded in Lowest Position

### Training in Industrial Plants

A bulletin entitled "Training Labor for Peace Time," has been prepared for free distribution by the United States Training Service, C. T. Clayton, director, of the Department of Labor, Washington.

By "industrial training" is meant brief practical instruction for industrial workers in the one best way of doing their respective tasks, such training being given in the plant. A training department such as the Training Service experts assist manufacturers in establishing is designed not only to start new employees right—important as that is—but it is intended as a permanent feature in the plant for the benefit of all, particularly the poor and mediocre workers.

In the concluding discussion of the pamphlet there is this pointed paragraph. "There is still another consideration that should prompt manufacturers to install systematic training as one of the instrumentalities of

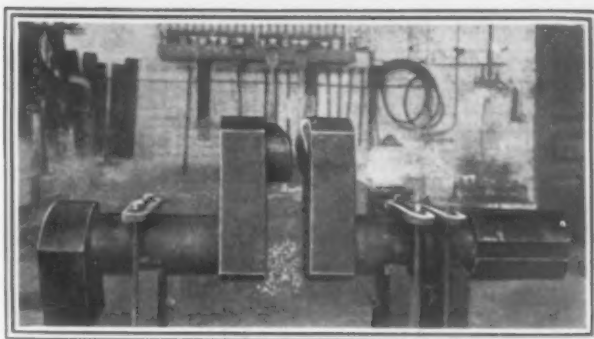


Fig. 1—Incorrect Method of Lining Up Broken Crankshafts. Broken Pin Journal Uppermost

If the slabs or webs did not present such broad flat surfaces to the molding material, the latter probably would be more readily crushed during shrinkage, but in cases such as this, which occur frequently, the surfaces are so broad and flat that the weld cannot possibly crush the molding material, and either a fracture at the edge of the thermit collar or the inclusion of an enormous strain is bound to result.

Experiments have been made with the various means for overcoming this by including in the mold between the slabs parallel plates of sheet iron with corrugated iron between; this combination dividing the sand of the mold between the slabs into two parts, the theory being that this light corrugated iron would sufficiently support the weight of the molding material and molten steel, but would readily crush at the time of shrinkage of the weld. In these experiments, even this slight resistance was sufficient to cause trouble.

The idea was conceived, therefore, of placing the riser between the slabs or webs, on the theory that the lateral shrinkage of this riser would be about equal to that of the corresponding weld below, also that the small thickness of molding material between the riser and the webs would be the only part of the total length for which the shrinkage would not be compensated. This method, shown in Fig. 2, has been used very successfully and is recommended for the consideration of all thermit welders. Care should be taken to see that the riser almost completely fills the width between the two webs, as otherwise only part of the desired effect will be obtained.

The operators will have a little difficulty in cutting off the risers from welds made in this way, especially if the oxy-acetylene flame is used for this purpose, because it will be found extremely difficult to remove the thin layers of sand between the riser and the webs, and difficulty will be found in obtaining a starting place for the cutting operation and the blowing through of the cinder.

As the shaft shown in the photographs was welded three or four times before success was attained, the mechanical difficulties of cutting the riser, the reader will agree, are more than offset by the assurance of a good weld.

their factories. If wage levels are to be maintained while the cost of living is lowered, and if foreign markets are to be opened to American manufacturers, it can only be by raising the national average output. That, in turn, can be accomplished only by increasing the production of the individual through intelligent, widespread industrial training of the workers."

This is but one of several bulletins being issued for free distribution by the United States Training Service, the address of which is in the Department of Labor, Washington. Any of them can be had upon request.

The steamship *Delungra*, the first 5000-ton steel merchant vessel built in Australia under the commonwealth shipbuilding scheme, has been launched at Walsh Island, New South Wales.

W. B. Spencer, second-hand machinery, has moved its office to 150 Nassau Street, New York.

## Triple-Purpose Radial Drilling Machines

Two radial drilling machines of a new size are announced by the American Tool Works Co., Cincinnati. These are known as 3-ft. and 3½-ft. triple-purpose radials, and are similar in construction to the 6-ft. size described in THE IRON AGE, issue of May 3, 1917. In addition to the drilling and tapping operations they combine a third function, boring.

A quadruple geared head affords four distinct speeds, which in turn are divided into two separate ranges of two speeds each, one for heavy tapping and boring, the other for high speed drilling and light tapping. The boring and tapping range, in conjunction with the six gear box speeds, comprise 12 speeds from 30 to 134 r.p.m., which are obtained through an internal gear drive on the spindle, while the high speed drilling range consists of 12 speeds from 155 to 700 r.p.m., obtained through an external gear drive, the internal and external gear-drives being non-interfering. These 24 spindle speeds are in geometrical progression.

The machines are built with either cone pulley or speed box drive, and in addition can be equipped with swinging box table, worm swiveling table, electric motor drive and special bases when desired.

### Tapping Machine

A bench type tapping machine has recently been brought out by the Bicknell-Thomas Co., Greenfield, Mass. The machine is compact and can be operated by a girl, as there are no protruding parts to catch the fingers or clothing. A cone friction driving mechanism, it is pointed out, enables the operator to tap to the

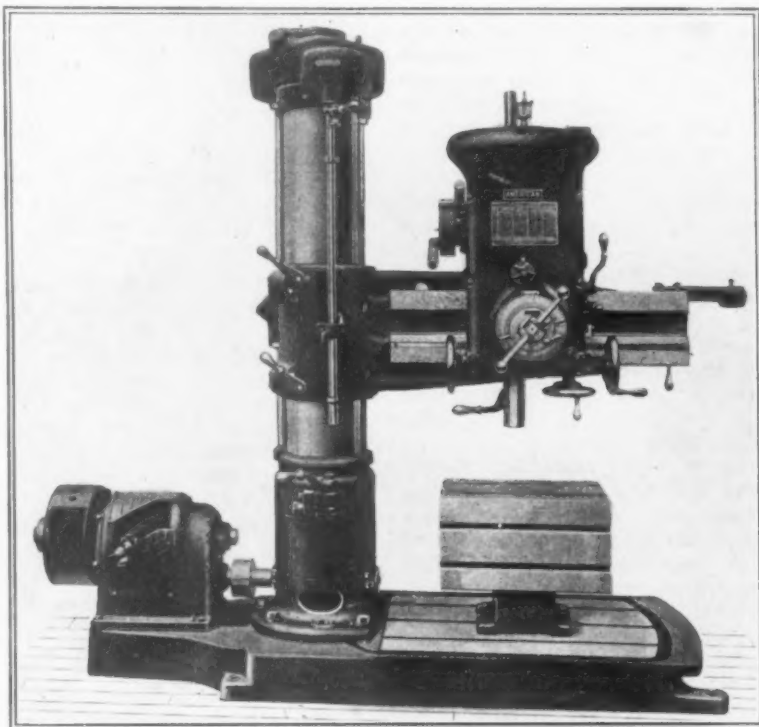
bottom of a hole without breaking the tap and also enables the operator to tap a larger number of holes per day. The manufacturer states that 24 3/16-in. holes have been tapped per minute. It has two-speed gear transmission, which is constantly reversing in grease, oiling all parts of the machine with the exception of the motor.

The table slide, which is made to hold suitable work holding fixtures, has ball bearings, an adjustable stop for the table, and is furnished with or without oil pump and piping.

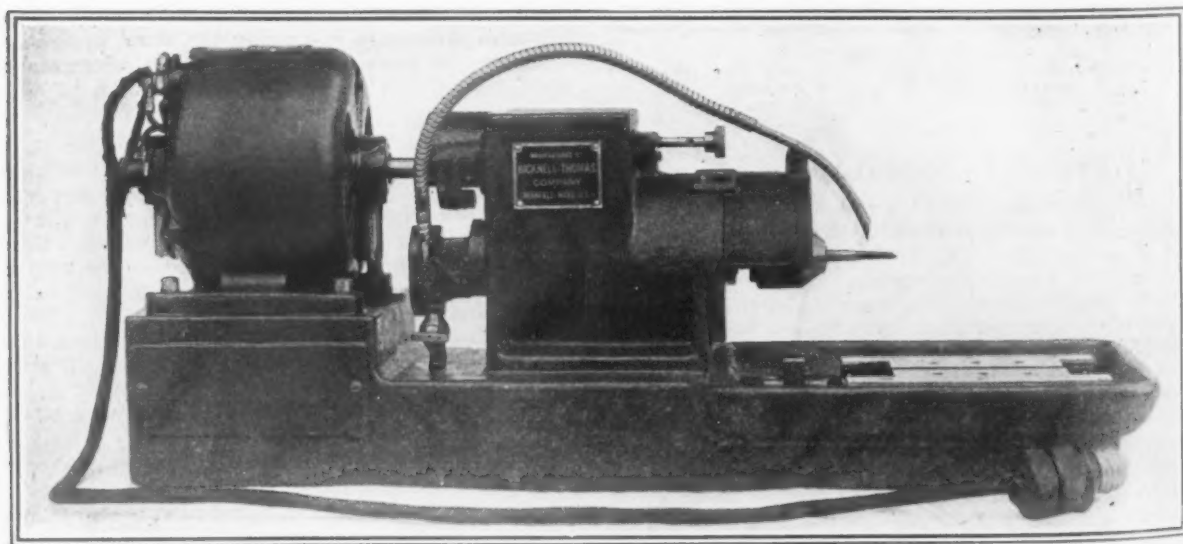
The Murai Trading Co., Ltd., Tokyo, Japan, writes to THE IRON AGE that it has been amalgamated with Meiji Trading Co., Ltd., and will trade under the name of Murai Trading Co., Ltd., with a capital of 3,000,000 yen. K. Murai, who had held the largest share of interest in the old firm, has been elected president, and S. H. Matsubara

vice-president. In all other respects, the new company is exactly the same as the old, with the exception of Teinosuke Murai, who has been elected a director. K. Ishikawa and Mr. Tad. Ayai remain as managing directors, T. Furuya and Shaw T. Nishimura, as directors, and G. Murai, as auditor.

Negotiations have been completed whereby the Hyatt Steel Products, Ltd., Granville Island, Vancouver, B. C., takes over the Canadian Metals, Ltd., Tudhope Electric Metals, Ltd., and the Steel Rolling Mills at Port Moody, B. C. The company will engage in the manufacture of steel, operating a three-phase, electric-arc, 6-ton furnace of 1500 kw. capacity. The ingots will be produced at the Tudhope plant on False Creek, where successful tests have been made, and will be rolled at the Port Moody mills.



Radial Drilling Machine Designed for Drilling, Tapping and Boring



Tapping Machine Designed to Eliminate Protruding Parts That Might Catch Fingers or Clothing. It is equipped with a cone friction driving mechanism

# Principles of Open-Hearth Furnace Design

Scientific and Practical Opinions Based on  
American, British and German Practice  
—Merits of Different Types of Ports

WITH object of raising British open-hearth practice up to or above the standards of continental and American practice, C. H. F. Bagley contributed a paper, "The Principles of Open-Hearth Furnace Design," to the fall meeting, last September, in London, of the Iron and Steel Institute. He discussed the subject from both the scientific and practical viewpoint in the light of some 15 years' experience in England, Germany and the United States. An abstract follows:

In order to melt steel at all, the first requirement is an exceedingly high temperature, and it can almost be said that it is hardly possible to attain too high a flame temperature, provided the flame is under control and not allowed to impinge direct on the brickwork. As in the blast furnace, so in the steel furnace, output and efficiency are functions of the average temperature attainable, rather than of the heat units generated; for temperature is the factor which determines the efficiency of utilization of such heat units. The chief object of regenerating gas and air is thus not so much the recovery and return to the hearth of a proportion of the waste-heat units, but rather to enable a higher flame temperature to be reached, by means of highly superheating both gas and air before bringing them into contact. It is important, therefore, that the highest possible temperatures should be reached in the checker chambers, so that they may be realized in both gas and air on reversing; and also that the checker work should be deep enough to allow a high average temperature to be maintained throughout each reversal.

## Theoretical Flame Temperatures

Consideration of the subject of theoretical flame temperatures shows that to realize the maximum it is important to provide not only a rich gas, but a dry gas and air (very important points, but outside the subject of furnace design), together with the minimum excess of air for complete combustion, and the maximum initial temperature on each. It is important that the initial temperatures of gas and air should be approximately equal throughout; for the fact of one being higher than the other rather implies that the other is less than it might have been, and the resulting flame temperature correspondingly lower. In designing the furnace, these points should always be taken into account; and the heating surface, and supply of heat to gas and air chambers respectively, should be arranged accordingly.

## Merits of Different Port Ends

The respective merits of different types of port ends are much-disputed questions, particularly as between the two standard types, the solid block with two air ports, and the open block with a single overhead air port; and it seems to remain purely a matter of opinion and of correct detail, to the absence of which so many failures are attributable. The second type is generally regarded as the keener and faster working design, and allows a short length of combustion space before the hearth proper is reached and, of course, removes the block so much further back on the outgoing end, thus reducing the chance of burning it. On the other hand, it is the weaker structure and requires more careful designing or the gas port is liable to lose its shape and throw the live gas on to the linings. Its natural tendency is to spread the flame and keep it down (whereas the opposite is the case with the three-port type), and a wider furnace is desirable for this type.

The three-port type, though slower working and allowing no preliminary combustion space, is said to stand up better, though it has to stand the direct heat

of the outgoing gases, and is liable to get burnt unless the gas supply is closely regulated. No great care is needed in design or building; there is less chance of burning the side walls (though more of the roof), and there is no brickwork subject to heat on both sides without cooling surface, as in the case of the arch between gas and air ports in the second type. On the whole, there seems little to choose. These remarks apply equally to tilting furnaces, but the necessity of movable port ends rather complicates the matter. In the second type the joint between furnace and port ends is made at the face of the block, the furnace end being open, and the ports built in a single solid block outside—which, of course, is a great weight. In the three-port type the joints are made in the ports themselves, the block face remaining in the furnace proper. By this arrangement it is possible to build the movable ports in three separate sections, none of them very heavy, so that they can be lifted and taken away by the overhead crane and a spare put back in their place. The repairs can then be done later, when cold, and the week-end repairs are very much reduced.

By careful design it might be possible to build a block of the second type in a single piece so light that it could be handled and changed by the overhead crane as the individual ports of the first type are. This would greatly simplify matters and yield the advantages of both. One of the advantages of a tilting furnace is the facility of getting at the ports for repairs at the week-end.

## Discussion

The following discussion by British steelmakers is abstracted from a report in the *London Iron and Coal Trades Review*:

Doctor Arnold said the author pointed out that the first requirement was an exceedingly high temperature, and it might be almost said it was hardly possible to obtain too high a flame temperature, provided the flame was under control and not allowed to impinge direct on the brickwork. As in the blast furnace, so in the steel furnace. What was required was not the theoretical calorific power, which might mean anything, but the actual calorific intensity. A question arose which had not been dealt with by the author: What were the calorific intensities in an open-hearth furnace? From many measurements that had been made in the 2-ton furnace at the Sheffield University they found the maximum flame temperature varied from about 1700 to 1750 deg. C., and the tapping temperature ranged from 1590 to 1620 deg. C. He was rather astonished, he said, that in a very large number of measurements made for a particular purpose on a 50-ton acid open-hearth furnace, to find that those temperatures were very much the same as in the small one.

## Volume of Checker Work

Mr. Saniter said the author suggested that the volume of checker work should be proportionate to the volume of gases which had to go through it, but he did not quite agree with the author that, in order to get that volume right, he should build a big checker chamber and half fill it with bricks. It would be better to build it of the right size, and have the checker work in both chambers of a similar character. In connection with slag pockets, the author suggested they should be half-filled with perished dolomite or other suitable material. The speaker said he would like to know what the object was. He had never heard of it, and if there was any advantage in doing so, which seemed doubtful, as it might flux the bricks away, he would be very glad to hear what it was. Another point, to which the author gave prominence, was with reference to regulating the

right quantity of waste gases through the gas and the air chamber, and he suggested that that should be governed by the size of the flues from those chambers to the chimney. He was afraid that it was not a practical suggestion to cut down the flues so as really to regulate. It was not merely a question between the two flues, because if they were made big enough they would not regulate themselves, and he was afraid if they were choked down really to regulate, the furnace draft would be very soon checked.

Professor Bone said one of the first things in connection with furnace design should be proper appreciation of what took place in combustion, and of the factors on which the heating in the furnace depended. Unfortunately users and designers of furnaces did not appear always to have followed sufficiently the developments that had taken place in the last 20 yr. with regard to combustion and flame, and furnaces were still designed and operated on a good many misconceptions which had survived from an anterior period. He did not know how it was possible to define the term which was so often used in papers as "theoretical flame temperature." He did not think there was such a thing. If it was meant that there was a theoretical constant which could be said to be the flame temperature for hydrogen or carbonic oxide, or any particular gas, he did not think such a thing existed. When one spoke of flame temperature under certain conditions, meaning the average temperature of a given volume of combining gases, he could understand what was meant, but only with the proviso that what was meant was an average temperature and not that the temperature was really uniform throughout. He thought the phrase ought to be banished once and for all from any scientific discussion of the subject.

#### Radiating Effect of the Flame

Another point which he thought the author had not taken into account was the fact that one did not depend for the heating effect of the flame in the furnace primarily upon flame contact at all, or even upon the temperature, but principally upon its radiating effect. If a cubic foot of hydrogen was burnt, one could measure and express in calories the total amount of energy which was going to be liberated but the whole of that energy never appeared in the products as sensible heat; part of it was directly radiated away instantaneously at the moment that the gases combined.

What happened in the furnace, said Professor Bone, was that the heat came principally by radiation from the flame, and what the checker brick took up was principally the sensible heat which was imparted to the hot products by combustion. The principal part of the energy which was not radiated had to be picked up by the checkerwork. The temperature of flame was only important in so far as it affected the radiation. The greater radiant effect that could be obtained from flame the more efficient the heating and the greater output from the furnace, because the heating of a charge by contact with hot gases was very slow compared with the transmission of heat by radiation, which went on with the velocity of light in the furnace. He thought that point was not sufficiently considered by furnace designers.

He was sorry to find, he continued, that the author contemplated furnaces which would require an excess of 25 per cent of air for complete combustion. That excessive amount of air ought not to be required in any decently designed furnace. It ought to be possible to burn gas and air almost in their theoretical proportions; in fact, with certain methods of combustion it could be done in almost exact theoretical proportions. A furnace properly designed ought not to require more than 5 per cent excess of air to burn completely the gas in the furnace.

#### Essential Duties of a Furnace

Mr. Ridge said it had to be borne in mind that the steel furnace had two essentially different duties to fulfill, having to melt the steel and at the same time to supply a certain amount of air for oxidation. He could agree that observation in a steel-melting furnace was extremely difficult. Taking gas samples and actually

ascertaining what was happening in the midst of the gas over a steel bath was extraordinarily difficult, if not impossible. Under those conditions it was necessary to go to some of the other metals for parallel cases, and taking into account the melting furnaces for other metals, he had found it was essential that the air and gas as passed into the furnace must be either in a more or less violent state of commotion, voluntarily mixing and impinging on the metal, or be projected downward as far as possible, if the maximum result from the amount of the producer gas passed into the furnace was to be obtained.

Careful gas tests in certain furnaces had shown it was only a very small stratum of the gas over a molten bath that effectively acted; the rest did not act by way of supplying oxygen for oxidation, and also did not act appreciably by way of heating. If careful observations on a furnace were taken with a height of 4 ft. of the center of the arch over the top of the molten metal, it was only the bottom few inches of the gas which were active, and while it had been taught that the radiation of heat caused by the reverberation from the arch was essential, he had found by very careful tests and a good deal of practical observation that every inch the arch could be brought down very appreciably improved the results.

Until an ideal firebrick material was obtained for the construction of the arch a material which would stand a much higher temperature than that of the gas in the steel-melting furnace, there had to be an excessive rise in order to prevent the spalling of the brick. He had been able to overcome that difficulty in certain cases by using special bricks for the arch with dependent parts which acted as an obstruction to the gas and arrested radiation, but at the same time that dependent part of each individual firebrick of the arch was not subjected to any compression strains. It meant in practice that the individual firebrick would stand a very much longer life than if it were built integrally into the arch. He had found that every inch and every portion of an inch that the arch could be lowered over a molten bath was an advantage, and that it was possible very appreciably to decrease the amount of gas which had to be passed through the furnace in order to obtain the desired heating effect.

#### Proportions of Hydrogen and Carbon Monoxide

Como Johns could confirm what Professor Bone said about the composition of producer gas; a high percentage of CO was found, in practice, more desirable than high hydrogen. Experienced melters soon noticed an increase of hydrogen, at the expense of the more desirable CO, and spoke of the gas as containing "too much steam," a schrewd guess at the cause of the trouble, which was really due to the higher ratio of steam to air blown into the producer. He knew of a gas-producer plant where the average composition of the gas made over a number of years ran at CO<sub>2</sub> 3.35; CO 29.40; H 11.60 per cent. That, of course, could only be achieved with separate control for steam and air. He had come to the conclusion that the gas port area should be as small as was consistent with efficient work, and he had noticed a tendency in many steel works in the same direction. Any discussion of the principles involved in the design of open-hearth furnaces should take into account the temperature distribution inside the hearth.

Mr. Johns said he had found in a furnace working properly, at the moment of tapping, the following apparent temperatures, to which a correction would have to be added to convert them into degrees Centigrade, but which would not alter their relative values:

Center of roof	= 1,575 deg. apparent temp
Tapping side wall	= 1,650 deg. apparent temp
Port block where gas last entered	= 1,655 deg. apparent temp
Exit port block	= 1,640 deg. apparent temp

Cases had been noted when the block where the gas entered was actually hotter than the face of the exit block, but this was obviously abnormal. The highest temperature found was always that of the center of the surface of the bath, and it is noteworthy that modern practice sought to plunge the stream of burning gas on to the surface of the bath, while the stream

swept rapidly to the exit ports. The temperature of the flame was in the neighborhood of 1850 deg. C. when the gas quality was good. Heating by radiation with a high roof was tried and failed many years ago. The whole difficulty with open-hearth furnace design was that the furnace was reversible. The port block that had at one time to control the combustion of the incoming gas and air would, during the succeeding time interval, be engaged in directing the waste gases to the regenerators at a stage when they were at a higher temperature, and thus much increased in volume. This double duty could only be performed at the cost of efficiency. A successful uniflow furnace would be a marked step in advance.

#### Replies by the Author

C. H. F. Bagley, in replying, said Professor Arnold had asked whether the temperature, given in the paper at 1500 deg., of the waste gases going out of the ports was actual or assumed, and how the figure was arrived at. All the figures throughout were assumed. The paper merely dealt with principles of open-hearth furnace design, not the actual sizes and dimensions, which might require varying under different conditions. With regard to the temperature of 1500 deg., everyone knew that if a live flame beat up against the blocks it very soon played havoc with them. He assumed that the temperature of the waste gases, after the flame had spent itself, would be considerably lower, and it was in the checker chamber where use was made of the 1500 deg. On reversal, he thought 1500 deg. was quite high enough. With regard to perished dolomite in

slag pockets, it was very often put in, and was a very convenient material. The temperature, as a rule, was not high enough to do the walls any great harm, and was not likely to flux the side walls. It had been the usual practice in all furnaces he had been connected with to fill the slag pockets with perished dolomite; the slag ran off it more easily than it would off a siliceous material.

Mr. Saniter had stated that the flue areas should not be cut down unduly, and that it was difficult to regulate the flow of heat through the gas and air chambers respectively by regulating the size of the flues. He should like to call Mr. Saniter's attention to the fact that the temperature of the gases passing through those flues was probably not more than one-fourth or one-fifth of the temperature at which they passed through the ports, and consequently the volume would be about one-fourth or one-fifth of the volumes passing through the ports. On the face of it, if they were the same size as the ports, they ought to be quite big enough. It was always surprising to him how well a furnace worked, even when its checkers were very nearly choked up, if a little gas could get through.

Professor Bone considered that 25 per cent excess of air was a ridiculous figure, and he quite agreed that it was. He did not think one could work on an exact theoretical combustion. But if there were 5 per cent excess of air, or even 5 per cent excess of gas, it would not make any great difference. In actual practice the men very rarely obtained the quantities required to such nicety that there was anything approaching theoretical combustion.

## BUILT BY SOLDIERS

### The Austin Co. Makes a Fine Record in Erecting Structures in France

A remarkable building accomplishment of American soldiers in France is revealed for the first time and shows the resourcefulness for which the country is noted. Early in 1918 the War Department needed at once eight large buildings close to the fighting lines. The contract was let to the Austin Co., Cleveland, by the director general of military railways, Feb. 1. About 30 days later Lieutenant Stocker, the Austin superintendent, left for France to supervise the construction. Twenty-eight days after the contract was let the entire shipment of materials necessary for the buildings was on the docks at Philadelphia ready for shipment.

The structures consisted of an erecting and blacksmith shop, 44 x 300 ft., having a crane runway of 20-ton capacity the full length of building and projecting out of the building 200 ft.; a machine shop, 44 x 300 ft., with 100 ft. of crane runway; a gas engine repair shop, 44 x 300 ft., with 120 ft. of crane runway; a car shop, 44 x 200 ft.; a storehouse, 44 x 180 ft.; an oil house, 44 x 80 ft.; a power house, with two aisles, 88 x 60 ft.; a foundry building, 44 x 100 ft., with a charging wing two stories high, 25 x 40 ft. The total area amounted to approximately 70,000 sq. ft.

Upon arrival in France, Lieutenant Stocker reported to Colonel Perkins, manager of light railways, at general headquarters, A. E. F. Certain changes had to be made in the drawings. With remarkable dispatch, the entire overseas shipment was loaded upon approximately 75 cars and was billed to Abainville, 400 miles inland and about 20 miles back of the front lines in the Toul sector. Abainville is a small village, with no railroad connections. For this reason, Col. Sam Robinson, general superintendent for the light railways, established himself there, after ordering four companies of engineers to that point, to be used for general building and grading purposes. On April 15 a switch was cut in on the main line of the French railroad, and temporary track built down to the site of the new railway repair shop. Upon completion of this siding the material was sent to the village and unloaded. In this shipment of 15,000 items there was missing but one small package of bolts.

Lieutenant Stocker, assisted by Capt. F. V. Blucher

and Lieutenant McIsaacs, assumed full responsibility for the erecting of the buildings. The labor was all furnished by the American Army, and of the 400 men available there was but one man with previous building experience. The foundations were begun about May 1 and the first column erected on May 6. In 30 days steel frames for all the buildings were up and the storehouse entirely closed in, and a portion of the other buildings had sheathing and steel sash in place. All equipment was to have been furnished by the Army, but it did not arrive at the time, so practically all erecting equipment was made out of materials on hand. Extra rod bracing was taken out of the buildings and cut up into pieces, and with the aid of a blacksmith was made into wrenches. Cheap French saws of the Woolworth 10-cent variety were cut up and made into putty knives. Purlins were spliced together and made into gin poles. Work continued 16 hours a day with 4-hour shifts. On June 10 general headquarters issued an order to stop all work on the buildings and tracks, possibly because the Boche was making steady gains. Shortly after the American success at Chateau-Thierry on July 29 the order came to resume operations. By August 15 all buildings were completed and 50 per cent of the machinery installed, making a period of approximately 45 working days to complete the project. Lieutenant Stocker has now returned from France and resumed his work with the Austin company.

The county commissioners at Pittsburgh have recommended the building of four new bridges, two across the Allegheny river, one across the Ohio, and one across the Monongahela river. It is proposed to build one bridge at 16th Street, to replace the bridge burned some months ago, a new bridge at 40th Street to replace a present bridge at 43rd Street, a new bridge over the Ohio river connecting the lower North Side with McKees Rocks, where the plant of the Pressed Steel Car Co. and other large plants are located, and also a new bridge over the Monongahela river between Glassport and Wilson, Pa. If these bridges are built, it will mean that thousands of tons of steel will be needed, and probably furnished by Pittsburgh mills.

The annual meeting of the American Zinc Institute will be held at the Hotel Statler, St. Louis, on Monday, June 9. The postponement of this meeting from May 12 was occasioned by the crowded condition of the Statler's calendar of events.

## Duplex Locomotive Rod Boring Machine

The duplex boring machine illustrated is manufactured by the Newton Machine Tool Works, Philadelphia. It is primarily intended for the boring of locomotive rods, but its usefulness has been extended to the rapid production of many parts which require heavy drilling, such as the reaming of cross heads, etc.

The advantages are summarized by the manufacturer as follows: The machine utilizes newly developed cup cutters, which dispense with the necessity of drilling pilot holes for boring bars; the kerf by the cup cutters in no case exceeds  $\frac{5}{8}$  in.; the cores are removed solid; two ends of one, or one end of two rods are bored at the same time; twin spindles allow duplication of center distances in like rods; cross heads may be reamed to advantage; by means of a speed box the variation in speed may be controlled by levers without a change of gears; odd jobs of heavy drilling may be done with dispatch.

The machine has been developed to obtain a maximum output from the best grades of high-speed steel, and to increase rigidity by properly supporting the spindles, thus to increase the number of parts for which the machine can be successfully used.

The top surface of the base is slotted and is surrounded by an oil pan cast solid with the base. The rail is of box type, braced internally by ribs.

The spindle saddle has an angular bearing on the bottom section of the rail to insure close contact under heavy pressure. The top bearing is square, the adjustment being made by means of a bronze taper shoe on the top and on the rear by a gib bolted to the saddle. The saddle is adjustable cross-wise by means of a pinion, the solid end of which is squared to fit a removable ratchet.

The spindle revolves in bushed bearings in the sleeve and has a Morse taper and drift and retaining key slots. The spindles are driven by worm and worm wheel, the driving worm being equipped with roller thrust bearings, and are encased for continual lubrication.

The upper end of the spindle and the rack sleeve are encased and protected from dust and dirt by covers, which also serve as a support for the counterweight. The thrust of the driving worm is taken by a bearing cast solid with the saddle. Motion for the feed is taken through spiral gears, one of which is mounted on the spindle sleeve; the other is keyed to the horizontal pull pin shank on which are also mounted four pull pin gears, giving four changes of feed, which are transmitted to the rack sleeve through a worm and worm wheel. This motion is clutched by means of cone friction, which permits of both power and hand elevation. The saddles have hand adjustment on the rail. The auxiliary or lower support for the spindles has a bearing on each upright; also hand elevation through worm and worm wheel. This bearing securely supports the spindle at the lowest possible point when cutting.

A side table is applied for the reaming of cross heads. The in-and-out adjustment of this table supplemented with the longitudinal adjustment of the spindle over the table permits of clamping the work without having to locate to the actual center. These adjust-

ments also permit of drilling or boring a series of holes on varied centers at one setting. The rail is extended to carry the spindle center 18 in. beyond the vertical face of the auxiliary table, which then gives a maximum distance between the spindles of 14 ft. 3 in. The distance from the top of the table to the spindle end is 50 in. maximum and 34 in. minimum.

The incorporation of speed boxes for use with constant speed motors allows for changes of speed by means of sliding sleeves without removal of gears. Each spindle is under the control of its own speed box, allowing the same advantages as the variable speed motor attachments. The incorporation of speed boxes for each spindle also permits running each spindle at the correct speed for the size of work.

The dimensions of the machine are as follows:

Diameter of spindle.....	4 in.
Diameter of spindle nose outside.....	2 1/2 in.
Length of automatic feed to spindle.....	15 in.
Minimum distance between spindle centers.....	30 in.
Maximum distance between spindle centers.....	11 ft. 4 in.
Maximum distance top of table to end of spindle.....	50 in.
Distance center of spindle to upright.....	17 1/2 in.
Work table.....	24 in. wide x 13 ft. 6 in. long
Morse taper used.....	No. 1

## Transformers for Electric Furnaces

A special design of electrical transformer has been brought out by the Electric Furnace Co., Alliance, Ohio, to supply a link in the control equipment of its

line of Bailly electric furnaces for heat treating steel and melting non-ferrous metal.

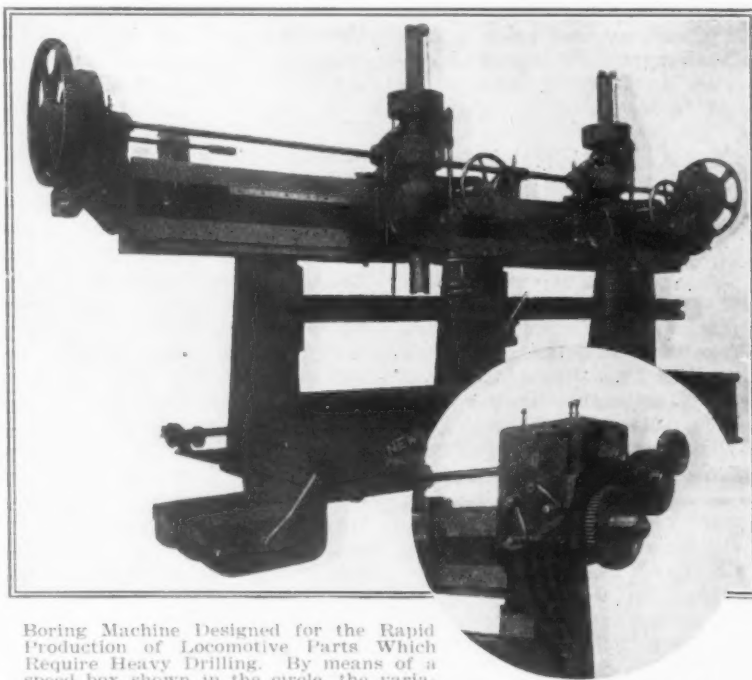
These core type transformers are of 400 k.v.a. capacity, and the high tension side, fitted with the usual voltage taps, is wound for 22,000 volts. The low tension side is fitted with 10 special voltage taps to meet the particular voltage requirements of the furnace. Each transformer is single phase, and for small furnaces requiring 100 kw. or less, one transformer is sufficient. Three-phase current is taken care of by two transformers fitted with a Scott connection.

By means of the special low tension voltage taps any desired current input may be delivered to the furnace through selective oil break switches that are a part of each installation. With furnace current under control, it is pointed out that any furnace temperatures may be maintained.

Transformers of this type have been built for the Braeburn Steel Co., Braeburn, Pa., to be used in connection with an 800-kw. continuous recuperative Bailly electric furnace that has been installed to anneal alloy steel bars and wire. This special alloy requires a slow heating, lengthy soaking at maximum temperature and cooling at a slow rate for the first 200 to 300 deg. It is stated that although the usual annealing box covers are not used, scaling is eliminated by this new method of electric annealing.

The executive offices of Slocum, Avram & Slocum Laboratories, Inc., New York, were removed to the fortieth floor of the Woolworth Building, May 1.

Knapp & Baxter, Inc., exporters of steel products, announce their removal to Oceanic Building, 2 Pine Street, San Francisco.



Boring Machine Designed for the Rapid Production of Locomotive Parts Which Require Heavy Drilling. By means of a speed box shown in the circle, the variation in speed may be controlled by levers without a change of gears.

# British Machine Shops and Labor Unrest\*

The Workers' Ignorance of Basis of Prosperity  
—"Wait and See" Plan of Readjustment  
—Tariff Against American Tools a Boomerang

BY SIR ALFRED HERBERT

WHILE the war atmosphere has been a stimulating one it has, of necessity, been an artificial one, inasmuch as the demand was such as to relieve machine tool makers of any reputé from all anxiety as to the obtaining of orders. There was an eager market even for machine tools of inferior grades, and in general terms the buyer sought the seller, and competition was greatly reduced. But with the cessation of hostilities and the cancellation of Government orders conditions are changing and true levels will in due course be attained. Great masses of engineering plants have been thrown idle at least temporarily and a good deal of time must of necessity elapse before useful work is found for all the available producing capacity.

## Mechanical Readjustment

The best brains of the country are engaged in the great task of reconstruction of industry, but the task is no easy one. Manufacturing concerns which for the past three years have been pressed to the utmost to keep up with a constantly increasing stream of Government orders are compelled to bring their programs to an end and to turn their energies to the satisfactory employment of their resources on work required for peaceful purposes. In many cases this involves new designs, new patterns, new tools—jigs and fixtures, new selling organizations and, most difficult of all, new relations with labor. There is a world shortage of almost every commodity and for a long time a market is assured to all engineers who can succeed in so effecting the necessary changes in their works and in their organizations as to obtain an early output of acceptable goods.

## Strained Credit and Uneasy Labor

But the new conditions with which industry finds itself surrounded are perplexing to a degree. Nothing is stabilized and it is impossible to see far ahead. Prices of many commodities are at a level which obviously cannot indefinitely be maintained. Labor is filled with unrest and shows little inclination to settle down to steady productive work. Money has been raised for war purposes to such an extent and spent with such lavishness that a false impression has been created as to the ease with which money and credit can be obtained, and the fact is lost sight of that while money can be produced on the printing press for temporary and internal purposes, yet such money is useless for international trade. Abundance of paper money at home goes hand in hand with lack of national credit abroad and the country can only be put on a satisfactory financial basis by the gradual building up of its dissipated resources and impoverished credit, and this can be accomplished only by production on a scale far in excess of what has been attained before the war.

There is no question that the present labor unrest militates more than any other factor against our early resumption of satisfactory industrial conditions. Projects affording almost unlimited scope for the employment of labor are held up day after day because of an entire lack of confidence in the future, and it seems impossible for industry to settle down to a satisfactory basis and for full employment to be found for labor, capital and plant until the present constant irritation and uncertainty can be removed. There has never been a time in the history of industry when the employer was prepared to meet the difficulties of labor so frankly and whole-heartedly as at pres-

ent, but when all is said and done it is an unchanging law that in the long run labor can be remunerated only out of the wealth created by the joint utilization of capital and labor.

The idea which appears to be held in some quarters that somewhere or other is a vast reservoir of wealth which can be drawn on to any extent is at the root of many of the misunderstandings and troubles from which the country is suffering to-day. Large projects of extension to industry and of the establishment of new manufacturers are held up indefinitely, and until mutual confidence is restored and earnest and uninterrupted work can be relied on satisfactory progress cannot be made.

The kind of vicious circle towards which at the present time so many businesses tend to drift is well illustrated by the motor car industry. Here is a trade which has suffered enormously from the necessity of abandoning entirely its regular production of motor vehicles and of devoting itself for the last three years to Government work in nearly all cases of a special character. The sudden cessation of Government work makes it necessary for the industry to get back to peace-time production at the earliest moment, and practically every motor car company has decided on a program of output, and is working towards the realization of this program, but the uncertainties as to the cost and attitude of labor and the similar uncertainties regarding values and supplies of raw materials, affected in their turn by the labor position, makes it almost impossible for definite prices to be fixed or for definite deliveries to be guaranteed. The country is eager for motor cars, but the purchasers are holding back largely because it is impossible to secure definite dates of delivery, and also because there is an entire lack of knowledge as to what the future values of motor cars are likely to be.

## America the Pacemaker

Similar conditions prevail in almost every industry and, while this country is drifting in many cases towards a policy of "wait and see," the United States is bending its immense energies and utilizing the enormous wealth which it accumulated in the early stages of the war toward the most energetic industrial campaign in the history of the world; and unless Great Britain is enabled very rapidly to settle down it will find itself forestalled to a very large extent in the foreign markets of the world.

The large accumulation of machine tools in this country is a source of some anxiety to the machine tool manufacturer, but there is little doubt that, given stabilized conditions, the great bulk of this plant can be rapidly brought into satisfactory employment. Much of the existing plant has been put down with special reference to the provision of projectiles and in the entire cessation of demand for this product such plant has only a limited utility and, moreover, owing to the conditions under which it has been worked, it has depreciated to such an extent as to be mainly useful only for rough and simple work. But on the other hand the plant that has been put down for more refined purposes, such as the manufacture of aero-engines is of a nature for which abundant employment will be found as soon as the country settles down, and there is little fear but that the machine tool trade of the country will find abundant occupation in supplementing and balancing existing plants and in meeting the demands of new manufacturing industries. Many of the less advanced engineering firms have learned from their experience in the war work that they have been compelled to

\*From an address before the North-East Coast Institution of Engineers and Shipbuilders, Newcastle-upon-Tyne, England, March 25.

undertake the necessity of more complete and better machine tool equipment and, with the certainty of much more costly labor and of shorter working hours the provision of really adequate machine tool plant must be faced.

Just as the advent of mechanical methods into the textile and similar trades gave rise to the wildest apprehension on the part of the hand-loom weaver that his livelihood would be taken from him, even so the introduction of labor-saving machine tools gave rise to similar misgivings in the minds of the old-time fitter. But although in both instances some immediate disturbance and need for adjustment to meet new conditions arose, yet it was soon made evident that so far from being reduced the actual effect was largely to increase both the demand for labor and the amount of its individual earnings.

#### Expansion of Mechanical Engineering

Besides the large number of highly skilled workers required for the production of the machine tools themselves the great development of engineering industry as a whole due to improved tools and methods created an ever-growing demand for labor and this growing demand led inevitably to a steady increase in wages. Even before the war the earnings of a competent worker was in many cases at least twice as great as those of his predecessor of five and twenty years ago, and whatever the condition of trade it has been rare indeed for a really competent workman to suffer unemployment.

But there is another and a very important effect on labor brought about by the modern machine tool. A new class of labor has in fact been created. The tool maker, the jig maker, the inspector, the machine tool charge-hand, the machine tool demonstrator, the process setter and the rate fixer have all, in fact, been brought into being by the modern machine tool in its application to mass production. This class of labor has been recruited from the more intelligent, the more earnest, and the more thoughtful among the rank and file. It is a class that is highly paid, and enjoys many opportunities of improvement and promotion to other and still more important responsibilities.

The machine tool maker is constantly confronted by instances in which expensive machine tools are bought and installed, and from which the user does not reap the full measure of benefit which the tools are capable of giving. To build a piano needs much skill and ability, but to play it with a master hand is an even more difficult undertaking. And so to get from a group of modern tools the output which they are capable of giving needs skill, determination and energy of no mean order. The future would seem to be full of opportunity for the aristocracy of labor in so controlling the selection, the setting up and the running of modern tools as to justify the capital expended in their purchase.

There is, of course, another direction in which all labor has reaped, though less obviously, great advantages from improved machine tools. Reference is made to their immense effect in cheapening production of essential commodities and thus bringing within the reach of the worker comforts and conveniences which would otherwise have been unattainable.

#### Folly of Excluding American Machine Tools

It is well that we should acknowledge our indebtedness to the United States for much of our progress in machine tool production and in workshop methods. American tool builders were stimulated to a great extent by the high level of wages. When labor is expensive, employers cannot afford to waste it. The most efficient methods must be employed and manufactured goods can only be produced at reasonable prices when made in large quantities, and capital must be spent generously in equipping workshops in the most complete and efficient manner.

In this country wages for many years were at a comparatively low level, and British employers therefore did not have brought home to them the necessity of employing labor-saving machinery in anything like so forcible a manner as was the case in America.

There are those who would wish to close British markets to imported machine tools, but no more foolish proposal could be made. The introduction of American machine tools, developed under the special conditions obtaining in that country—mass production of output and dear labor has been of the greatest service to this country in preparing it gradually to meet similar conditions. Machine tools of the highest excellence are prime necessities to the whole of the engineering and allied trades of this country, and any policy which would tend to make it difficult or unduly costly for British machine tool users to obtain the best machine tools wherever produced, would be as shortsighted as the taxation of raw material.

Although it may appear paradoxical, taxation on imported machine tools would be a grave disadvantage to the British machine tool maker, as well as to the user. Competition is the best stimulus in the world—it is nature's stimulus—and under it the British machine tool industry has increased enormously in output and advanced correspondingly both in design and in excellence of workmanship. A policy of taxation on imported machine tools might temporarily please those British makers who are either inefficient or who wish to rest on their laurels without constant and renewed effort, but in the long run it would result in a serious check to progress, both in engineering generally and in machine tool manufacture in particular. It must be remembered, too, that the immediate effect of protective tariffs is to increase cost of production, and this handicaps the British tool maker and the British tool user alike in the neutral markets of the world.

#### New N. & G. Taylor Co. Plant Clubhouse

With the idea of providing a substitute for the saloon, the N. & G. Taylor Co., manufacturer of forging steel, is putting up a building at its Cumberland Works to be used as a canteen and restroom. This will partake of the nature of a workmen's club. It will be open to men of the plant at all hours, for use not only as an eating place, but for recreation. At one end of the building there will be a well-equipped lunch counter, serving wholesome food, coffee, milk, ice cream, cold drinks in summer, etc. There will be a large open fireplace for winter use, with numerous comfortable armchairs, tables for reading matter, periodicals and card-playing. One end of the building is reserved for pool tables.

The building is to be located at the main entrance to the plant and it will have a wide porch extending the full length of the side facing the entrance roadway. This porch will be well supplied with comfortable chairs and benches, and the railings will be horizontal, to provide convenient footrests. The interior of the building will be entirely clear of posts, so that there will be no obstructions in case the building is used for dancing, moving pictures or boxing matches. The company's Target and Arrow brand of roofing tin will, of course, be used.

The company already maintains a well-equipped employees' building, with individual shower baths and modern sanitary equipment; and this new addition is to add further to the comfort and convenience of the men at this plant.

The National Standard Truck Cost System is now issued by the Truck Owners Conference, Inc., 327 South La Salle Street, Chicago. It is stated that this is now in use for checking the operation of over 18,700 trucks, and that it has been found that where supposedly accurate truck costs were kept there was a variation of 65 per cent in keeping the depreciation or sinking fund record, 21 per cent in handling maintenance changes and 13 per cent in keeping tire costs. A folder with forms sufficient for one truck for one year is issued for 25 cents; in quantities of 100 or more, 20 cents each.

Shop lighting is discussed in bulletin No. 22 of "Safe Practices," published by the National Safety Council, 208 South La Salle Street, Chicago. It includes a discussion with views of various shop lighting schemes.

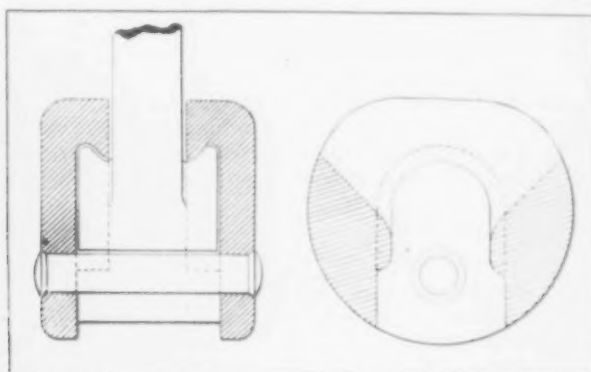
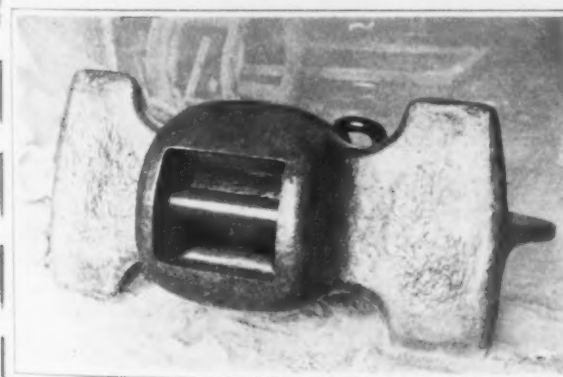
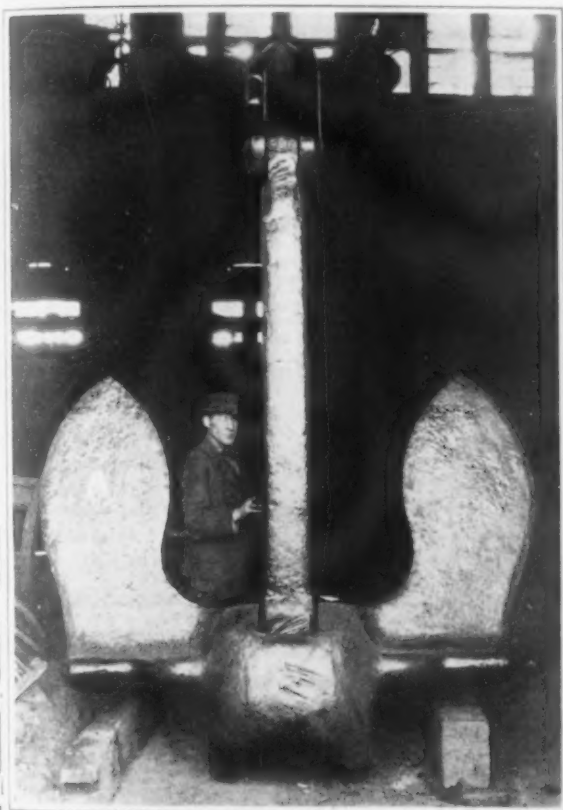
## NEW TYPE OF ANCHOR

### Allison Cast Steel Product for Which Special Advantages Are Claimed

The steel foundries of the Chester, Pa., district have for many years enjoyed the distinction of producing more cast-steel anchors of various types than any other district in the country. While true before the war, this reputation has been distinctly enhanced as a result of the war. Among the anchors made before the war

flukes of the Allison anchor tend to make it more effective in holding than other types. The flukes are wider and more spoon-shaped than any others, and are set parallel. There is no patent about this feature because it is merely a matter of design, but the company states that the reason it is able to design these so as to get more gripping surface is because of the patent feature of the shank and core in the head of the anchor in which the shank sets.

The core in the head of the anchor is designed like a keystone, except that in order to get a 4-point bearing a double fillet is used. It is believed that this



Features of the Allison Cast Steel Anchor. The line drawing shows the Keystone design where the shank fits, the double fillet affording a 4-point bearing. The wide flukes, decidedly spoon-shaped, are a feature.



may be mentioned the Baldt, Dunn and the Admiral, all cast steel, and made by different foundries in that district.

With the expansion of the shipbuilding industry came a demand for anchors in proportion, with the result that one or two new types have been put on the market. Prominent among these is the anchor known as the Allison, the salient features of which, as well as the illustrations, have been furnished THE IRON AGE by Allison & Co., Chester, designers and makers of this new anchor.

A feature claimed for this new type of anchor is the shape, size and construction of the flukes. While it is a fact that none of the anchors of other types that have been accepted by the various inspection bureaus, including the United States Navy, have not held when in service, it is claimed that the design of the

makes it a much better proposition to manufacture, and a stronger casting because of getting away from sharp corners. It is thus possible also to obtain a great depth from the center of the pin to the top of the anchor, which, it is understood, the Navy has always been particularly anxious to procure. Ribs and sharp corners have been eliminated, and it has therefore been possible to obtain a metal practically uniform in thickness, which to a great extent guarantees the absence of cooling strains in the casting.

The designers claim that they are also able to strengthen the top end of the anchor, where the shank goes in, by the distribution of metal at this point, thereby offering a stronger and heavier casting and a greater assurance of non-breakage when the anchor is dropped, which, of course, includes the falling weight together with the weight of the anchor and the chain,

for when anchors are dropped, and hit hard surfaces at the bottom of the sea, many of them are broken.

Owing to the locking feature of the grip of the shank it is claimed as readily discernible that were one of the heads of the Allison anchor to crack, the locking feature of this grip would hold the cracked pieces together and the head of the anchor would not be lost, for as soon as the head of an anchor is cracked the breaking of the anchor is completed by the pull when the pulling strain is placed on the anchor. Because of the free movement in the core where the shank works, there is sufficient movement to permit easy passage of water and such other matter as might otherwise foul and clog the anchor.

It is stated that all the preliminary and subsequent tests of the British Lloyd's and the American Bureau of Shipping have been successfully passed without difficulty. The Allison anchors are in use by the United States Navy, with all tests successfully met. From the manufacturing standpoint the anchor is claimed to be a success, because there are no points in its construction that are complicated either in the forgings or the castings.

### Slot Milling Machine

A machine designed for milling internal grooves in gun carriages but adapted for slotting holes over 7-in. in diameter within practical limits is manufactured by the Beaman & Smith Co., Providence, R. I. A rigid box bed, individual motor driven cutter and feed, heavy milling bar and supports, revolving table for making two slots with one set-up of the work and a fast forward and reverse motion of the milling bar, are the principal characteristics of the machine.

The milling cutter is carried on a vertical spindle in a steel bar driven through reduction gearing by a variable speed motor. Part of this gearing is carried

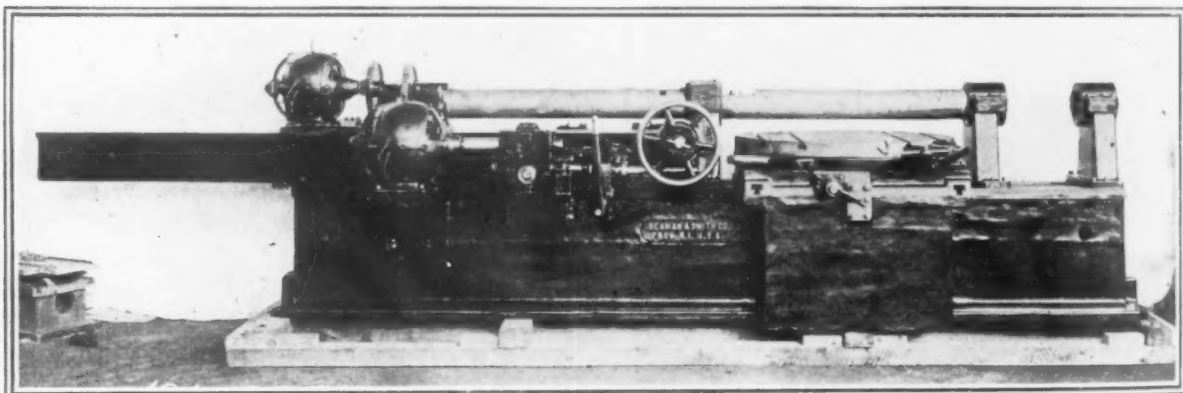
The feed and fast motion are driven by another motor and the fast motion is operated by friction clutches controlled by a lever on the front of the machine. Close beside this lever is the feed hand wheel, power being applied to the feed screw by means of a clutch in this wheel. With the clutch out, hand feed or fast motion in either direction is obtainable, and with the clutch in, power feed in one direction only is possible. Two changes of feed are obtained through gears and other changes through the variable speed motor; on the screw this makes from  $\frac{1}{2}$ -in. to  $\frac{1}{4}$ -in. per min. The fast motion varies from 4 ft. to 12 ft. per min., dependent upon the speed of the motor.

A revolving table, operated by hand, is used to carry and turn the work in order to slot the opposite side without changing the set-up and thus to insure parallel slots. In revolving, the table is carried on ball bearings, but when in working position it is clamped down on a large flat bearing.

After the motors are started the operation consists chiefly of the proper handling of the feed clutch, fast motion lever, and the revolving of the table. With a fixture for holding the work it is stated that rapid and accurate production can be maintained.

### By-Products from Blast Furnaces

That volatile potassium cyanide and carbonate, together with a much smaller amount of sodium compounds, may be withdrawn from the bosh of an iron blast furnace through suitable openings near the tuyere zone and condensed in quantities sufficient to make the process commercially feasible is claimed in a patent (U. S. 1,292,937—Jan. 28, 1919) granted to H. B. Weaver and James Gayley of New York. The patentees state that these compounds are formed at the focus, and exist unchanged for a certain distance up



Machine Adapted for Slotting Holes Over 7 In. in Diameter. The cutter and feed are driven by separate motors and a revolving table for making two slots with one set up is provided

in the bar. The cutter spindle has double and single row ball bearings at the head and tail end respectively.

The cutter bar is ground to a sliding fit in the support brackets and the end which carries the cutter is clamped securely in a bearing on the saddle after being located by a dowel pin in the bearing. Adjusting screws in the bottom of this bearing work against a pin in the bar which turns enough to allow accurate alignment of the cutter. This device is for locating the dowel hole in successive bars when it is desired to take more than one cut in the same slot. The dowel pin has a threaded end to allow quick removal. It is pointed out that once the dowel hole is located the cutter bar can be set rapidly. The spindle drive shaft in the bar is connected to the main drive shaft by a coupling located immediately behind the clamp bearing on the saddle, and allows for the rapid changing of cutter bars.

The saddle, which carries the cutter bar, motor and reducing gearing travels on flat ways on a slide attached to the bed, and has a bearing surface that is more than three times longer than it is wide, thus to insure accuracy of alignment. Wear is taken up by a gib. A bronze feed nut is attached to the bottom of the saddle.

the bosh in the hot reducing atmosphere, but there break up, and the basic portion is largely condensed and returned. In this manner a zone of high-alkali volatiles exists, being continually renewed by the descending charge, and bled mostly by the formation of slag. It can, however, be abstracted either continuously or intermittently as noted, care being taken to withdraw a quantity of gas which carries less heat than the normal excess of hearth over shaft heat. This is controlled by frequent test slag-taps—dark slag immediately indicates improper working and slagging of iron due to excessive withdrawals of heated gas.

The Dominion Steel Corporation, Sydney, N. S., is making progress on extensions to its plant. Work on the construction of the new power plant has been started by the Foundation Co. The building is specially designed with a view to further extension, which, it is understood, will include the operation electrically of all departments. The new building will be used in conjunction with the old building, but later the latter will be discarded entirely. The Wabana mine, the company's source of ore supply, is also to have a new power plant. The mine has always been electrically operated, the new plant being additional.

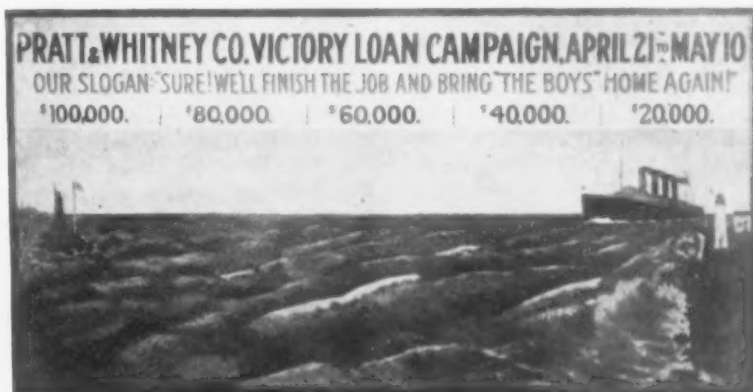
# Steel Industries Support Victory Loan

Subscriptions Totaling Many Millions—Complete Success Expected at the Close—Unique Methods Employed—Nearly Half Subscribed

**T**HROUGH 60 per cent of the nation's quota of \$4,500,000 of the Victory Loan remained to be raised the final week of the campaign, there is prevailing confidence that the remainder will be forthcoming with the customary last-minute rush that has characterized former loans. The Treasury Department called attention to the fact that almost as high a percentage had been subscribed at the beginning of the last week as was subscribed at a corresponding stage in the Fourth Liberty Loan. Poorer industrial conditions to-day are believed to account for the apparent slowness of the campaign.

In New York the Hardware, Metals and Allied

Trades committee had subscribed about 75 per cent of its quota, while the Machinery committee reported 25 per cent, with good prospects ahead. Among the recent subscriptions in New York from the steel and allied industries were the following: Lackawanna Steel Co., \$500,000; Metal & Thermit Corporation, \$125,000; Consolidated Steel Corporation, \$125,000; American Car & Foundry Co., \$2,000,000; Singer Sewing Machine Co., \$500,000; American Can Co., \$505,000; Underwood Typewriter Co., \$520,000; Remington Typewriter Co., \$500,000; American Steel Foundries, \$320,000; New Process Metal Co., \$41,000; Federal Adding Machine Co., \$25,000.



Pratt & Whitney Co.'s Electric Sign Showing Progress of Victory Liberty Loan Campaign

**T**HE Iron and Steel Committee of the Victory Liberty Loan in Buffalo is making good progress in the securing of the allotment of five and one-half million dollars assigned to it: \$4,787,850 of the amount having been taken, up to Saturday noon last, and the committee expects to have its full quota in before May 10.

## Buffalo Doing Well

Some of the larger amounts now subscribed by the iron and steel interests are as follows: The Lackawanna Steel Co., \$750,000; C. H. McCullough, Jr., president, \$50,000; the Rogers-Brown Iron Co., \$300,000; Wm. A. Rogers, president, \$100,000; Hugh Kennedy, manager, \$50,000; Buffalo Union Furnace Co., \$200,000; Frank B. Baird, president, \$50,000; Harry Yates, vice-president, \$50,000; Seneca Iron & Steel Co., \$200,000; Seneca Iron & Steel Co. officials, \$65,000; Donner Steel Co., \$200,000; Lackawanna Bridge Co., \$100,000; Employees Buffalo Foundry & Machine Co., \$105,200; Employees Donner Steel Co., \$60,000; Employees Buffalo Union Furnace Co., \$45,850. A large number of the smaller iron and steel industries of the city have subscribed from \$50,000 to \$75,000 each.

## Chicago Slow in Gathering Momentum

The Victory Loan campaign in Chicago is showing results rather on account of the untiring efforts of the committees soliciting subscriptions than because the public is in a mood to lend its whole-hearted support to the work. Both the iron and steel and the machinery committee are encountering difficulty because of the large numbers of workmen out of work and the uncertainty of those employed as to the permanence of their jobs. Nevertheless, as was mentioned a week ago, two sections of the iron and steel committee have filled their quotas, and a third, namely the warehouse steel subdivision, Charles Heggie, Scully Steel & Iron Co., vice-chairman, has nearly secured its allotment. E. P.

Welles, chairman of the machinery committee, reports that Chicago branches of outside firms are, for the most part, liberal in their subscriptions to this loan.

## In Iron and Steel Industries

The iron and steel industries in the St. Louis district as usual are among the chief subscribers to the Victory Loan and are largely responsible for the maintenance by the Eighth (St. Louis) Federal Reserve District of first place in the standing of all the Federal Reserve districts. Among the subscriptions received were the following: Commonwealth Steel Co., \$200,000; office force \$30,000 additional; Clarence H. Howard, president of the Commonwealth Steel Co., \$100,000; Beck & Corbitt Iron Co., \$50,000; Wrought Iron Range Co., \$99,000; employees, \$8,000; American Car & Foundry Co., \$125,000.

Birmingham, Ala., took a twilight sleep after a brilliant start on its \$7,000,000 Victory loan quota, but awoke with a start and by the end of the week had made good progress. The Sloss-Sheffield company subscribed \$350,000 and other industrial concerns in proportion. The Sloss-Sheffield total subscriptions to Liberty bonds have been \$3,600,000. There is no doubt that Birmingham will go over the top during the week, although the going has been harder.

Cleveland started the last week of the Liberty Loan campaign with approximately one half of its quota of \$81,500,000 unsold. Subscriptions during the past few days have improved, and the second week showed a considerable gain over the previous week. Many of the largest industrial companies have not yet announced their subscriptions. Among the larger subscriptions of the past week were the following: McKinney Steel Co., \$1,000,000; M. A. Hanna & Co., \$650,000; Cleveland-Cliffs Iron Co., \$500,000; Hydraulic Pressed Steel Co., \$350,000; Standard Parts Co., \$250,000; Warner & Swasey Co., \$100,000; Cleveland Twist Drill Co., \$100,000; National Acme Co., \$75,000; Cleveland Steel Co., \$50,000; W. G. Mather, \$50,000; Eberhard Mfg. Co.,

\$50,000; B. F. Bourne, \$40,000; Union Rolling Mill Co., \$30,000; D. Z. Norton, \$30,000; A. W. Henn, \$25,000; Ajax Mfg. Co., \$25,000.

At the end of the second week of the Victory Loan campaign, subscriptions in Mahoning county, Ohio, aggregated about \$7,500,000, with many subscriptions from the steel plants still untubulated. Of the total \$1,719,750 was taken by corporations. Youngstown Sheet & Tube Co., workers had taken about \$1,000,000 worth of bonds by the end of the second week; Carnegie Steel Co., employees, \$800,000; Republic Iron & Steel Co., workers, \$700,000 and Brier Hill Steel Co., employees, \$500,000.

#### The Pratt & Whitney Sign

The progress made in recording subscriptions of the earlier Liberty loans at the plant of the Pratt & Whitney Co., Hartford, Conn., was shown by the use of a clock dial, placed over the main entrance to the office building. A change in this method was adopted for the fifth Liberty Loan, and this consists of a ship crossing a waterway, suggesting the act of bringing the boys home, and forms a very brilliantly colored sign located in place of the clock and over the office door.

The ship on the sign is movable and travels from right to left according to the way subscriptions are on record. The picture shows the sign as when first put up, and the ship is at the extreme right. It is now, as a matter of fact, just as near the extreme left. The full quota of subscriptions had been very nearly raised late last week.

#### Employees Subscribe

Subscriptions to the Victory Loan in the Pittsburgh district have fallen somewhat behind former loans, and hard work will have to be done in the next week if the quota assigned to Allegheny County is to be reached. Reports received from the various soliciting committees so far show that industrial workers in the Pittsburgh district are subscribing more liberally for Victory notes than employers and others who have larger resources. In many cases, wage earners in the mills and factories of the Pittsburgh district have already exceeded their subscriptions to the Fourth Liberty Loan, in spite of the fact that work is not nearly so plentiful, or wages in some cases as high, as when the Fourth Loan campaign was made.

The largest individual subscription at Pittsburgh so far is that of the Jones & Laughlin Steel Co., which subscribed \$5,000,000, this including the company itself, its officials, directors, all affiliated interests and subsidiary companies, and also employees.

The intensive campaign started last week by officials and employees of the Westinghouse interests closed on Monday, May 5. Subscriptions secured amounted to over \$1,000,000 and the managers of teams say that nearly every employee of the Westinghouse interests subscribed to an amount equal to one month's wages.

The Thompson-Connellsville Coke Co., Uniontown, Pa., subscribed for \$100,000 of Victory notes, making a total of \$500,000 in Federal securities held by this company. The subscription was made by J. P. Brennen, president of the company, who will probably retire from that position in a short time.

As showing the keen rivalry among the employees at plants to subscribe for the Victory Bonds, it is related that a laborer in the employ of the Mesta Machine Co. at West Homestead, Pa., pulled \$1,000 out of his pocket, representing his savings and invested the whole amount in Victory Bonds. Herman Steigel, a foreman in the plant, not to be outdone by this display of patriotism, at once invested \$2,050 in bonds.

Two electric reversing mill equipments, each designed for a peak load of 19,000 hp., are being supplied to two steel works in the north of England by the Siemens Brothers Dynamo Works, England. One plant will drive a 36-in. and the other a 34-in. roughing and finishing mill.

## TAX BILLS DEFEATED

### No Legislation Unfavorable to Ore Interests-- New Type of Washing

The Royalty tax bill, which was expected to pass, and was so reported in THE IRON AGE two weeks ago, did not, the vote being taken after this paper went to press, and resulting in the defeat of the measure by a majority of one in the Senate. The House had already passed the bill by a huge majority. One of the members of the State Tax Commission, a body whose functions are supposed to be judicial, was the author and sponsor for this bill, and this, with certain specious arguments for it, gave it much strength. Its defeat was entirely unexpected.

Iron ore shipments from the head of Lake Superior are considerable: Michigan ranges have as yet forwarded little ore, but are now beginning operations.

A few mines have closed, among them the Stevenson, belonging to the McKinney Steel Co. Its cessation was announced to be due to "no sale for ore," but the mine is really a scam and some development is necessary to permit the recovery of most of what little ore is left there. This development was considered inadvisable at this time. The closing of this mine has no bearing whatever on the general situation. A washery of a new and simpler type than those now in use has just been completed and this week began operations at the Leonidas mine of the Oliver Iron Mining Co., near Eveleth. It consists merely of two 35-ft. logs. The customary log washer as developed on the Mesaba range is a somewhat close imitation of the Oliver plant at Coleraine, in which the main log boxes have been cut open near the rear and below the water level with a hole of sufficient size to induce a flow from those boxes to the subsidiary logs called "turbos" and which were patented by John C. Greenway, who was manager of that plant at the time of construction. At that time these turbos seemed a refinement in process, and an addition to the efficiency of the plant. Experiments since then seem to have convinced the Oliver company itself, as well as others, that this claim is not necessarily true, and the new Leonidas washer is the result. The logic of the work is in favor of the new hypothesis, and if this new plant works as well as it is expected to, and produces the tonnage looked for, it will result in a decided simplification of washing practice on the Mesaba. Unfortunately, the Oliver company is not prepared to take advantage at the great Coleraine plant of its own work at the Leonidas, for the main structural details of that plant are such that it cannot well be simplified by the removal of the turbos and the use of the main logs only.

Acting on complaint of Texas-Carnegie Steel Association, as to rates on iron and steel articles shipped from Pittsburgh by way of New York to Galveston and Houston, and thence inland to Oklahoma and points in Louisiana west of the Mississippi River, the Arkansas Western Railway Co. and connected lines are required in a tentative report submitted to the Interstate Commerce Commission to reduce their inland rates to not more than 40c. per 100 lb. for the first 500 miles, and not more than 66c. per 100 lb. to points outside the Shreveport, La., zone.

The coming mechanical devices that will make ship-loading economical is the subject of an article printed in catalog form and distributed by the Material Handling Machinery Manufacturers' Association, 35 West Thirty-ninth Street, New York. The article illustrates and describes shiploading cranes, and pier and warehouse freight handling equipment. It was reprinted from *The Americas* published by the National City Bank, New York.

The Matthew Addy Co. has removed its Chicago offices from the Rookery Building to 1232 McCormick Building, 332 South Michigan Avenue.

## TO CONFER ON RAILROAD STEEL

### Thursday's Meeting in New York on the Price Situation

WASHINGTON, May 6.—Observers here are skeptical concerning the prospects for a settlement of the controversy between the Industrial Board and the Railroad Administration, at Thursday's conference of the latter with the steel producers in New York. Director General Hines returned from a three weeks' inspection trip yesterday, but was not ready even to announce the names of the men who will go to New York for the conference with the steel producers. It was expected, however, that they would include Judge R. S. Lovett and Henry Walters who represented the Railroad Administration in previous conferences.

Secretary Redfield of the Department of Commerce and Chairman Peek of the Industrial Board announced that they had become mere onlookers, and would take no steps until after Thursday's session had brought results. The Industrial Board secured the consent of the steel men to attend Thursday's session. The telegram of Mr. Hines agreeing to be represented at such a conference, if it could be arranged, specifically stipulated that the Industrial Board was not to participate unless it were called in as mediator by one of the other of the parties.

No one here could speculate on the probable program for the meeting. The railroad men deny that they are ready to make any definite proposals. It is reported that they will present a compromise suggestion concerning steel prices, and the figures of \$43 for Bessemer and \$45 for open-hearth have been mentioned. But these have no authoritative foundation.

It has developed, however, that just before the Industrial Board gave up its last effort to secure an understanding, the Railroad Administration tried to in-

duce the Industrial Board to present a figure to the steel producers as the basis for a new schedule. The Railroad Administration, however, refused to give this figure to Secretary Redfield or Chairman Peek unless the latter would bind themselves in advance to indorse it. This they refused to do. Secretary Redfield also declared that he opposed any policy of bargaining over these prices, and insisted that they should be determined by actual figures of cost of production.

There is nothing to indicate that the Railroad Administration officials have any new details as to production costs. It is expected that they will merely attempt to secure further concessions from the steel men, on the basis of promising business at certain figures. It is not even known, however, whether Mr. Hines is in a position to make definite promises concerning tonnage, even if a figure is fixed.

How the result of Thursday's meeting can have an important bearing on general market conditions, it is difficult to see from this end. To most observers here, the attitude of the steel producers is one of great patience toward the experimenteering of the Wilson Administration theorists. The elaborate price stabilization program never did offer great opportunity for business stimulation, and the failure of the Government to make good on its end of the plan by keeping all its purchasing agents in line only converted the experiment into a means of demoralizing general market conditions.

Just now the Administration is worried more than ever over the bolshevist symptoms of the labor situation. The advent of spring has permitted the farms to absorb much of the Western unemployed labor, but this has not been felt in the industrial centers. There the delay in construction and the general stagnation in many lines has increased the surplus of labor. The luxury industries, chiefly that of automobile manufacturing, have offered the principal bright spots. O. F. S.

### Consent to Arbitration Cannot Be Withdrawn

WASHINGTON, May 6.—The National War Labor Board has established an important precedent by deciding that once consent to arbitration has been given by a party to an industrial controversy, that consent cannot be withdrawn. The board ruled that public interest made such consent irrevocable. Not only does this ruling extend to the cases before the board, but the board seeks to establish it as a principle covering all "industrial arbitration."

"In arbitration at common law between private parties," says the decision of the board in the case of the Akin-Erskine Milling Co. of Evansville, Ind., "the general rule is declared to be well settled that either party could revoke an agreement of submission at any time before an award. This principle is really based upon the recognition that any private agreement was subject to revocation, subject to the right of a party to sue for damages, if sustained, and also upon the principle that the courts did not recognize the authority of an arbitration until actually consummated.

"It is clear that this right of revocation, incident to common law arbitration has no application to arbitration of the conditions of employment between employers and employees, known as industrial arbitration."

### New Coal Land Deal Pending

UNIONTOWN, PA., May 5.—That an entirely new deal is pending for the sale of the vast estate of J. V. Thompson was revealed here at an inquiry conducted in the equity court to determine whether the Thompson creditors' committee was still active. George R. Scrugham, secretary of the creditors' committee, and the representative of the unsecured creditors in the board of bankruptcy trustees, testified that a deal was pending involving the whole estate and that negotiations had been well advanced. He declined to name the prospective

purchaser in open court, but affirmed his willingness to give either the court or counsel the information privately. A. Plummer Austin, a member of the creditors' committee, confirmed Mr. Scrugham's testimony in that particular.

### Reorganization of Office of Director of Sales Progressing

WASHINGTON, May 6.—The reorganization of the office of the Director of Sales in the War Department is progressing slowly. Lieut.-Col. Guy Hutchinson has been made an assistant director of sales and will have charge of all matters relating to machine tools, motor and horsedrawn vehicles, construction building material and railway equipment and plant facilities. Charles E. Hildreth, who is in charge of the machine tool section, held a conference in New York this week on questions relating to appraisement. The machine tool inventories are still incomplete.

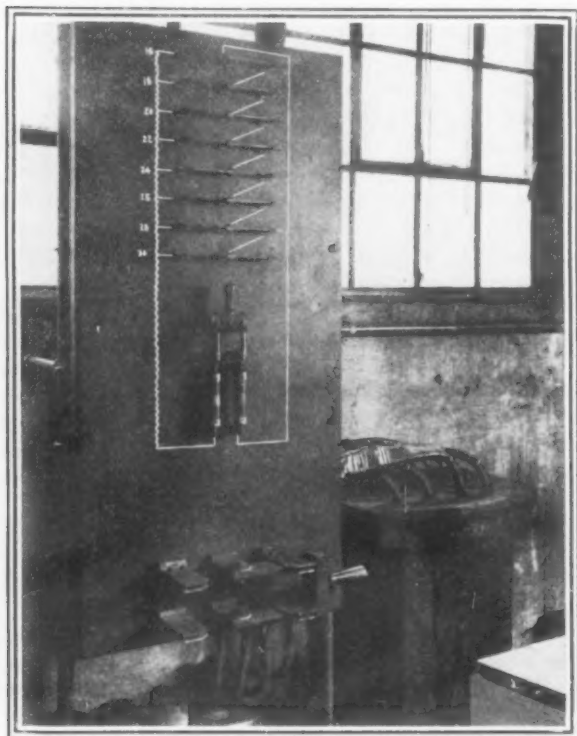
Col. Fred. Glover has also been made an assistant director of sales and put in charge of the disposition of all surplus property belonging to ordnance and ordnance plants, raw materials and scrap, aircraft, and quartermaster stores.

The War Department has made public the figures of the engineer material and equipment on hand in the depots of the American Expeditionary Forces in France. Most of them show an increase since the signing of the armistice.

Bids on the United States Government picric acid plant at Brunswick, Ga., will be opened on May 20 at the Cincinnati District Salvage Board. The plant consists of a 2000-acre tract on which are located all the necessary buildings for its operation, including a power plant and dwellings for officers and workmen, some partly completed. Bids for the plant must be for the entire Government property, including land, buildings, materials and equipment.

## Electric Heating Furnace

An electric tool-tempering furnace which uses the barium-chloride and salt principle is in use at the South Philadelphia works of the Westinghouse Electric & Mfg. Co. The outer shell of the furnace is a cast iron



Westinghouse Switchboard and Transformer Which Controls the 16 to 30 Volt Alternating Circuit to the Electric Tool-Tempering Furnace

cylinder, about 3 ft. high and  $3\frac{1}{2}$  ft. in diameter, which is packed with fire brick and occasionally a layer of asbestos. The circular reservoir in the center is 12 in. in diameter and 14 in. deep.

The heat is supplied by two pairs of electrodes built in on opposite sides of the walls of the reservoir. The electrodes operate on a 16 to 30-volt alternating current circuit which is controlled by a switchboard and transformer. Carbon sticks are placed between the electrodes in the reservoir to complete the circuit.

The current is started on the 30-volt circuit. Salt is fed into the reservoir, and when it is melted it acts as a conductor and completes the circuit. The carbon



Electric Tool Tempering Furnace in Use at the South Philadelphia Works of the Westinghouse Electric & Mfg. Co.

sticks are taken out. A mixture of barium chloride and salt is then fed into the reservoir, the final proportion being about 60 per cent barium chloride. When the temperature of the liquid reaches 1425 deg. Fahr. the voltage is lowered.

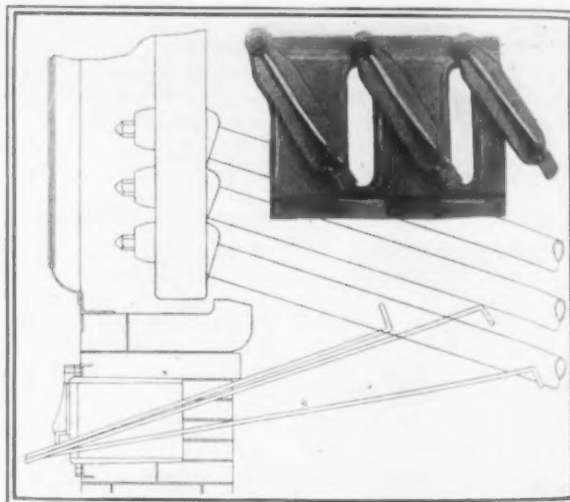
The current regulation at the switchboard gives a quick method of control so that the temperature of the liquid can be held at the predetermined degree of heat required for each specific tool. The tool, it is claimed, is thus heated uniformly from surface to center and soft spots in the finished tool are eliminated.

## Tube Scraping Device

The usual tube dusting doors provided in horizontal water tube boiler settings do not give access to the under side of the bottom row of tubes. To meet this condition the Combustion Engineering Corporation, 11 Broadway, New York, offers a tube scraping device consisting of a door casting, doors and wall boxes, the purpose of which is to provide openings in the front or rear wall of a boiler setting through which a light hook may be used for scraping the cinder from the bottom and sides of the lowest row of boiler tubes. These boxes are made in sections of 3, 4 and 5 doors which are spaced the same distance apart as the boiler tubes in the boiler in which they are installed. Two or more sections are bolted on angles or Z bars along the top and bottom sides providing one opening or door for each space between the tubes, so that the sides of the tubes may be reached as well as the bottom, and also the bottom of the second row of tubes.

The boxes are about 12 in. deep, ribbed vertically between each door or opening, and are in short sections of 21 to 35 in. in length. Each opening is covered by a swinging door or cover, the lower end of which passes behind a tapered spring catch which can be adjusted by a light blow of a hammer to hold the door tightly against the box.

When cleaning the tubes the attendant takes a rod



Casting with Doors which Provides Openings in the Front or Rear Walls of a Boiler Setting Through which a Hook May Be Inserted for Cleaning the Cinder from the Lowest Row of Boiler Tubes

about  $\frac{5}{8}$  in. in diameter and 10 to 12 ft. long, of the same shape as an ordinary fire hook with one prong about 5 in. long. By striking a projecting lug on the door, the door is swung to one side and the hook pushed in the hole. The two tubes immediately in front of the opening are then scraped with one or two passes of the hook along the sides and bottoms, the hook withdrawn and the door closed by striking the door lug with the hook.

Headquarters of the National Association of Waste Material Dealers will be moved from Boston to the eleventh floor of the Times Building, Times Square, New York the latter part of this month, the change to New York having been announced in THE IRON AGE of March 27. The formal opening of the new headquarters, with a reception for members, will be held June 16, the day preceding the regular quarterly association meetings. Officers of the association are planning the establishment of a mercantile service for the benefit of members.

# Atrocious Treatment of French Industries

American Commission Describes the Damage Done, But Predicts That France Will Be Dominant Factor in Steel Manufacture in Europe

WASHINGTON, April 29.—The coal of the Saar valley, whose acquisition has been claimed by France to offset the destruction of the French mines by the Germans, produces poor coke for blast furnace use, according to a special report made to the Bureau of Mines by a commission of mining and metallurgical engineers which has just returned from the devastated regions of France. As a result of the poor qualities of the Saar coke, the French blast furnaces are running inefficiently, says the report. American representatives are now trying to help the French to secure Westphalian coal for their furnaces.

Despite this handicap, the report declares that the French steel industry promises to be one of the first assets of that country and the return of Alsace and Lorraine will make France the dominant factor in the future of the European steel industry. The iron mines of France, according to the report, suffered relatively little damage, but the furnaces, foundries and steel plants, as well as the coal mines, were ruthlessly devastated.

The preliminary report is the work of Frank H. Probert, consulting engineer of the Bureau of Mines, and dean of the College of Mining, University of California. Mr. Probert, together with Dr. F. G. Cottrell, chief metallurgist of the Bureau of Mines, and George S. Rice, the chief mining engineer, made up the American mission sent to Europe last January on the invitation of the French High Commission to investigate the damage done to the mines and steel industries of Belgium and France, and to advise with the foreign officials concerning the reconstruction and the rehabilitation of the mineral industry.

## Employees Made Captives

Mr. Probert visited the iron mines of Nancy, Briey, Longwy and Luxemburg; coal mines in the Province of Saar, and the coal district of Pas de Calais. In his preliminary report Mr. Probert says:

"Early in the war the German hordes swept southward through the iron basins of French Alsace and Lorraine, and for nearly four years this renowned mining area was held and exploited by the invaders. Many of the employees were made captives and compelled to work in the mines under German direction. The international boundary between France and Germany was drawn in 1871, to give the victor of the Franco-Prussian war control of the iron fields, but since that time scientific development, guided by a better understanding of the local geology, exposed for France a greater ore reserve at lower horizons than that of Lorraine Annexée. With the return of Alsace and Lorraine to the mother land France will become the dominant factor in the future steel industry of Europe. During the German occupation the iron mines were not intensively exploited because of the necessity of recruiting into the Teuton army every able-bodied man and on account of the large accumulation of war minerals in preparation for the war. The actual physical damage to the iron mines is relatively small when compared with the destruction of the coal fields of northern France, which was as reprehensible as it was complete. Only in a few cases, where pillars have been robbed, is there any collapse of underground workings in the iron mines, but the equipment, both surface and underground, has been misused, and where ore has been mined the lack of development will defer realization of capital until the exploratory work is sufficiently advanced to admit of daily output approximating pre-war conditions. The mines are not seriously crippled, but what of the steel plants in which the iron ores are smelted? No such atrocity was ever perpetrated

against the industrial life of any country. Magnificent plants, comparing favorably with anything we have in the United States, are now but a tangled, twisted mass of structural steel and broken stone. The willful demolition was scientifically planned and systematically carried out. This after the removal of all such mechanical and electrical power units as could be used in Germany. The maliciousness and efficiency with which this crime against French industry was conducted is almost unbelievable.

## Destruction in Coal Districts

"In the coal districts of Pas de Calais and Nord, a sector fought over from the beginning to the end of the war, changing hands frequently, bombarded all the time, all surface structures whether of town, village or mining enterprise have been razed. This may be legitimate warfare, but now that the guns are silenced and the frenzy of combat is past, it is horrible to look upon. Arras, Douai, Bethune, Bapaume, Lens, Loos, Courriere, centers of coal-mining activity but a few years ago, and the mainspring of French industrial life, are gone, but the indomitable spirit of France survives and already plans are laid for the future. Bruay, at the western edge of the known coal field, was not in the fighting zone, and its output has been steadily maintained, but going eastward the frightfulness is more and more appalling, for the hate of the Hun left its mark on the mines during his forced retreat. The coal measures are overlain by water-bearing strata, necessitating special methods of shaft sinking and support to keep the mines dry. The steel lining of the shafts was dynamited, letting in the quicksands and flooding the underground workings for many miles. In the entire Pas de Calais region it is estimated that 120,000,000 cubic meters of water must be pumped before mining operation are resumed. Having flooded the mines, the headframes and surface equipment were systematically dynamited, the twisted debris in many cases filling up the demolished shafts. It will probably be five years before this coal district can be rehabilitated and 12 to 15 years before it gets back to normal pre-war output. The first great need is for buildings in which to house the workman.

## The Saar Valley

"The Saar coal fields were visited by the Bureau of Mines officials. Here, in striking contrast to the mining districts of France and Belgium, the coal industry is at its height. German workmen and German engineers are still employed, but under the direction and supervision of French officers. A spirit of unrest is apparent everywhere, the suspense of the peace negotiations, uncertainty as to indemnity to be exacted and lack of food, are telling on the already broken morale of German workmen. Unfortunately the Saar coal does not give a desirable metallurgical coke to the French, and the blast furnaces now running are working inefficiently. Westphalian coal is much desired, and a special committee of which George S. Rice of the commission is a member left for Cologne to investigate the possibilities of early shipment from Westphalian to France.

"The French attitude toward her allies is an interesting psychological study. France has been hurt, really hurt by the long conflict. She has suffered perhaps more than any other nation; the battles have been fought mostly on her soil, her manhood has been drained of its best and most productive blood, her industries, her economic mainsprings, have been ruthlessly destroyed. These two classes of French thought are desirous that France rebuild herself, financed by German indemnity. They seek neither money nor advice from others; the irrepressible spirit will be all-sustain-

ing. Directors of industry, mine owners and employers of labor, possessed of the same love of country, look on the problem from another viewpoint. They claim that money borrowed from other countries at reasonable interest rates, new equipment for mines and plants purchased from America for early delivery, will admit of an earlier return to pre-war scale of operation and the higher immediate cost will be more than offset by the earlier realization of profits from natural resources and raw materials.

#### The Future of France

"It would be presumption on the part of an American mining engineer to suggest improvements in methods or practice in French mining. The French engineers have long known their own problems, and

have solved them in accordance with their system of finance and amortization. Their mines are developed and equipped with the idea of permanent industry, and unless there is serious labor unrest and extraordinary advances in wage scales, the old French practice is peculiarly suited to French conditions. Their policy is progressive. There is constant search for new mineral areas or extension of proven deposits. French Lorraine has greater iron ore reserves than those of Lorraine Annexe, and just before the outbreak of war, drill holes had shown the extension of the coal measures of Pas de Calais to the south. Iron and coal are complementary minerals. France has them both in larger quantity than in 1914, and when her reconstruction program is carried out the steel industry will be among the first assets of a land that has suffered greatly."

## SAFETY AND OXY-ACETYLENE

### Precautions in the Manufacture and Transportation of Materials for Welding

Safety in relation to the manufacture and transportation of materials and apparatus used in connection with the art of welding and cutting, was discussed in an address on oxy-acetylene welding and cutting, delivered by A. Cressy Morrison, secretary and treasurer International Acetylene Association, New York, at a meeting of the Western Pennsylvania division of the National Safety Council. The following notes have been taken from the address:

The very high temperature of the oxy-acetylene flame is due not only to the combustion of the acetylene which means a chemical combination of the hydrogen and the carbon of acetylene with the oxygen, but to another quality which raises the temperature from the 4000 deg. which marks the apex of temperature in any other combination to 6300 deg. which is approximately the temperature of the electric arc. This peculiarity of acetylene and the extra vigor of the flame which makes it the only available flame by which general welding can be accomplished is due to the fact that when acetylene is formed, during reaction between the carbide and the water, the molecules take up heat instead of giving it off. The amount of latent heat locked into the molecules of acetylene approximates 300 B.t.u. This latent heat is called endothermic energy. When acetylene burns, the moment the molecule enters the flame, it breaks, releasing its endothermic energy and instantly the hydrogen and carbon combine with the oxygen adding to the combustion, and the temperature of the whole is thus concentrated in an instantaneous dissociation and recombination which gives acetylene its unparalleled temperature and its far-reaching usefulness.

The endothermic energy of the latent heat of the acetylene molecule must of course be given consideration when acetylene is compressed, for with each added atmosphere of pressure the distance between the molecules is reduced. It is a well established fact that when acetylene is under ordinary conditions one molecule may break and release its energy without having any effect upon those surrounding it, but when the distance is reduced by pressure the releasing of the heat of one molecule will affect the whole mass and instantaneous dissociation takes place. The possibilities of accidents from this source were early ascertained and the result has been that throughout the world laws have been passed which forbid the compression of acetylene above 15 lb. per sq. in. unless the compression is done under well known technical conditions and unless the compressed acetylene is immediately absorbed in cylinders containing asbestos, kieselguhr or similar approved porous material, saturated with acetone or a similar approved solvent.

I have gone into the details of this subject to emphasize the necessity of avoiding any attempt to compress acetylene into cylinders by any of the methods of compression used for other gases. I wish to warn you further against what appears to be a

very simple method of securing acetylene under pressure by means of a generator so constructed that the carbide and water are brought together and the resulting gas accumulated until the desired pressure is attained. These generators are known as self-compression generators and at one time were constructed and held forth as safe by unscrupulous manufacturers with disastrous results. They are forbidden by the rules of the National Board of Fire Underwriters and by laws and ordinances in all countries.

#### Oxygen and Apparatus

The production of oxygen is now a very large industry and plants and warehouses are widely distributed and adequate supplies are available everywhere. The question for the safety engineer is simply one of proper precaution as to the source of supply. If the oxygen is manufactured for use at the plant the serious considerations are the selection of high class apparatus, its installation and securing the technical ability necessary to run, manage, and safeguard it.

On the question of cylinders, the Interstate Commerce Commission has spoken and hazard from the cylinders as regards pressure explosions may be said to be eliminated. An oxygen cylinder contains oxygen compressed to 1800 or 2000 lb. per sq. in. and has proved itself to have an adequate margin of safety to hold these pressures under all vicissitudes of transit and use.

The apparatus used for combining oxygen and acetylene at the point of use which means the pressure gages, regulating valves, hose and the blow-pipe itself, are again under the jurisdiction of the Underwriters' Laboratories. Approved and permitted apparatus of high class is built sturdily for use, is calculated to burn the gases with the greatest possible efficiency, both as to consumption and resultant available temperature. The user having selected his apparatus with these facts in mind, attempting no shortcuts or false economies, will find himself protected at every turn by the co-operation of the best part of the industry with the underwriters who happily in anticipation of the development of the welding and cutting art in this country laid down rules and regulations which have governed it ever since.

### Suggested Improvement for Open-Hearth Furnaces

Improvements in open-hearth furnace design are claimed to be covered by a patent (U. S. 1,296,189—March 4, 1919) granted to Marinus Hvid, Chicago. The invention has to do with a new arrangement of flues and checkers whereby the gases are directed from slag pockets to the tops of the checker chambers through flues leading from the former to the latter in order to cause the hot dust-laden gases to pass downward through the checkers with flues beneath them. From these flues at the bottom of the checkers the spent gases pass through flues, provided with reversing valves, to the stack. In order to use the residual heat in the gases they may be passed through boilers on the way to the stack. The patent papers give detailed drawings of the proposed arrangements.

# Conservation Applied to Brass Plant Wastes

## Experiments Recover Valuable By-Products from Non-Ferrous Acid Wastes in Connecticut—Reduction of Boiler Scale by Lessened Stream Pollution

**A**T a meeting of engineers in Waterbury, April 8, there was discussed the relation of industrial wastes to the pollution of lakes and rivers and their tributary streams. Connecticut has an industrial waste board not only co-operating actively with the state board of health, but doing a lively research work of its own in determining feasible projects for the dilution of the existing contamination in order to lessen present evils and also to devise practical means for the better salvage of whatever there may be of value in any product heretofore cast aside as useless. Information is collated and worked up by the board for the use of manufacturers in the effort to provide reclaiming methods that will justify themselves on sound engineering principles.

The board has had the co-operation of Prof. James A. Newlands of the Henry Souther Engineering Co., Hartford, Conn., and the following is an abstract from his account at the meeting of the work already done upon the wastes from brass plants.

### Manufacturers Co-operate on Research

The necessity for some regulation of waste disposal by dilution has been recognized for a long time both by manufacturers and by the general public. A number of manufacturers throughout the State have, upon their own initiative, spent considerable sums of money and have made definite progress in reclaiming certain types of wastes, but it is evident that a more general effort will be necessary if the streams are to be maintained in a condition which will best serve every interest.

The law in Connecticut was passed for the purpose of enabling State officials and manufacturers to combine their efforts in the development of methods for economically recovering valuable materials now being discharged into the streams, and, following the enactment of the law, a number of manufacturers signified their willingness to co-operate with the industrial waste board to the extent of supplying means for carrying out in their works practical experiments necessary for the successful development of these methods.

Through the courtesy of F. S. Chase, John Goss and L. C. Smith, we were able to begin a series of studies on different types of brass wastes at the Chase Metal Works, the Scovill Mfg. Co. and the Stamford Rolling Mills Co. respectively, and while our work is by no means complete, a brief outline of the investigations may be of interest. Technical assistance, both in the development of plans and in their practical application have been freely given, and in this connection we are especially indebted to Messrs. Price, Sperry and Weaver of the Scovill Mfg. Co., Messrs. Stokesbury, Bennett and Johnquist of the Chase companies, and A. P. Meng of the Stamford Rolling Mills. The development work for the board has been done by N. J. Thompson.

### Neutralizing Pickle Tank Wastes

We were fortunate in having access to a very complete plant for neutralizing pickle tank wash water at the Stamford Rolling Mill in Springdale, Conn. The company, because of objections on the part of manufacturers below them on the Noroton River, have spent over \$40,000 for apparatus, including settling tanks, Dorr tankers, pumps and other equipment. The wash water amounts to about 25,000 gal. per day and the treatment at present consists of neutralizing the free acid and precipitating copper and zinc with lime, and because of further objections to the discharge of the effluent into the stream, the treated water is re-circulated through the mill.

While this arrangement eliminates the stream pollu-

tion problem, operation of the plant is expensive and disposal of the sludge, which is worthless, presents greater difficulties than were at first anticipated. As objections to the discharge of the effluent in the stream are based on the increase in lime hardness of the water, we are going to determine if the existing equipment will operate satisfactorily with sodium carbonate or soda ash instead of lime. Any method, however, involving the removal of metals and free acid from dilute wash water is likely to be expensive, and I believe that under ordinary conditions, treatment of the more concentrated wastes will be sufficiently effective from the standpoint of stream improvement and certainly more promising from the standpoint of recovering valuable by-products.

### Salvage from Bright Dip Wastes

At the plant of the Scovill Mfg. Co., in Waterbury, Conn., a number of possible methods for utilizing bright dip wastes containing sulphuric, nitric and hydrochloric acids have been under investigation. The problem with this type of waste is especially difficult because electrolytic methods are not applicable and processes involving evaporation are likely to be troublesome. The copper can be recovered, as is done at a number of plants by cementing out with scrap steel, but the liquid discharged into the stream is only a little less objectionable by reason of the fact that it contains iron sulphate instead of copper sulphate. The treatment does have the advantage, however, of practically neutralizing the free acid in the wastes and is profitable.

But more thorough treatment of these wastes is desirable and our investigations have included methods for concentrating the drip from the pickle tanks and treatment of the concentrated liquors. We have found that the drip washed into a still water tank can be brought to a fairly high concentration without staining the work, a condition favoring profitable recovery of by-products. It has also developed that the amount of the different acids used varies over wide limits not only in different plants but in the same plant from day to day and representatives of the Scovill Mfg. Co. are now working on a standard mixture of acids for bright dip work. If a suitable mixture can be developed, its general adoption should materially reduce the amount of free acid now discharged into the streams with bright dip wash water, and will simplify the treatment of the concentrates.

### Treatment of Sulphuric Acid Pickle Liquors

At the Chase Metal Works in Waterville, Conn., our investigations have had in view the development of methods for treating sulphuric acid pickle liquors. We began with electrolytic methods as the by-products can be recovered in form suitable for use again at the plant. After completing a few laboratory experiments, a small but practical electrolytic plant capable of handling about 185 gal. of waste liquor was installed. Some minor difficulties were experienced during the early tests, but we were finally able to get satisfactory results both in copper and zinc recoveries.

Briefly, the treatment involved a reduction of the copper content electrolytically to about 4 grams per liter after which the solution was neutralized with zinc oxide from flue dust and the remaining copper and any cadmium present were cemented out with scrap zinc. Small amounts of iron, arsenic and antimony, if present, were removed by means of manganese dioxide and powdered limestone. The zinc could then be deposited electrolytically from the pure sulphate solution down to about 5 grams per liter. Careful cost estimates indicated that copper, zinc and sulphuric acid could be recovered profitably from wastes of the concentration

tested even on the basis of pre-war prices. Fresh pickle solutions must be used, however, for a considerable period before the metal content reaches the normal found in practice and even the accumulation of a sufficient amount of metal to warrant electrolytic treatment necessitates the use of the pickle for at least a week. It was found that during this period of concentration approximately 15 to 20 per cent of the copper and 30 to 40 per cent of the zinc in the solutions was carried into the stream in the form of drippings from the work.

While it was evident that the process could be made profitable in the larger plants where a cheap supply of zinc oxide from flue dust is available and where a number of pickle tanks can be treated consecutively, the method has not been advocated as a greater improvement in river conditions.

#### Zinc Sulphate as a By-Product

After experimenting with various combinations of electrolytic and chemical methods, we have about reached the conclusion that straight chemical methods will best serve our purpose and we are now studying the possibilities of recovering the copper by cementing it out with scrap zinc after neutralizing with zinc oxide and then evaporating the purified liquor to obtain zinc sulphate. We have produced several hundred pounds of zinc sulphate crystals which compare favorably in purity with that now on the market. The cost estimates indicate that it can be made profitably at present prices. The effect on the market of a possible large increase in the supply from brass mills must be considered, however, before definite steps toward production may logically be advocated, and this phase of the problem is now under consideration.

#### Industrial Wastes and Boiler Efficiency

In some sections of the State the discharge of these wastes into the city sewers has very materially increased the difficulty of treating the municipal sewage. In the Waterbury district, however, where most of the waste outlets discharge directly into the streams, the problem is rather one of maintaining the streams in condition suitable for the various uses to which they may be put by manufacturing interests. As each pound of free sulphuric acid discharged into the stream produces about 1 1/3 lb. of calcium sulphate to increase the manufacturers' troubles in the power house and each pound of copper or zinc discharged in the form of sulphates produces a little over 2 lb. of calcium sulphate, it is evident that reasonable control of these wastes will produce a proportionate reduction in the cost of operating the power plants by reason of lower scale formation in the boiler tubes.

The waters in this district are quite soft, the Naugatuck River showing a temporary hardness of about 10 parts per million parts of water at the present time. On this basis, the discharge of more than about 80 lb. of sulphuric acid per million gallons of water would give the stream an acid reaction, and as the writer has found acid water at certain power house intakes the foregoing figures do not represent only future possibilities. The problem is worthy of serious consideration on the part of every manufacturer using the streams of the State and in connection with the work in this district, the industrial waste board will appreciate any assistance or advice which will help bring our investigations to a successful conclusion.

Holcroft & Co., contracting engineers, Book Building, Detroit, designers and builders of foundry furnaces and ovens, have opened an Eastern branch office at 924-6 Real Estate Trust Building, Philadelphia, in charge of E. V. Holcroft, recently manager of the William Kennedy & Sons plant at Collingwood, Ont., and William H. Holcroft, furnace builder of Chester, Pa.

The new Chicago office of the Van Dorn Electric Tool Co., Cleveland, manufacturer of portable electric drills, reamers and grinders, is located at 527 South Dearborn Street, and extends through to 528 Plymouth Court. William Cottrell is sales manager at the Chicago branch.

## Zirconium in Steel and Alloys

The following interesting statement regarding ferro-zirconium and zirconium in steel is taken from a paper, "Zirconium, Its Occurrence and Application," delivered before the Ceramic Society (British) at Swansea, Wales, September, 1918, by H. C. Meyer, vice-president Foote Mineral Co., Philadelphia, and printed in *Mineral Foote-Notes*:

Various unauthenticated reports have been circulated in the United States as to the remarkable properties of German armor plate, samples of which are said to have been analyzed and found to contain zirconium. It has already been noted that Krupp, of Essen, were, prior to the war, investigating zirconium, and it is interesting to note that the Brazilian Government reports show that in 1913 there was exported from that country 1119 tons of zirconium ore. As there was no important consumption of the ore at that time, in either the United States or England, it is natural to assume that nearly all of this went to Germany.

It has been known for some time, and patents have been granted on the application of ferrozirconium as a scavenger for removing nitrogen and oxides from steel. One of the most recent alloys of zirconium placed on the market consists essentially of between 40 and 90 per cent zirconium, with the residue mainly iron or an iron group metal. Small percentages of titanium and aluminum are also introduced. This series of alloys is covered by U. S. Patent No. 1,151,160. It is claimed that the alloy is not subject to oxidation, is highly resistant to chemical reagents, and is readily malleable. It is suggested that one of the alloys in this series may find important application in the manufacture of drawn filaments for incandescent lamps. Such filaments are claimed to have the property of selective radiation; in other words, emit more light than corresponds to the temperature at which they are heated by the electric current. This implies a considerably lower wattage per candle power than is now required by the average metal filament lamp. A typical analysis of some of the alloys produced under the above patent shows: Zirconium, 65 per cent; iron, 26 per cent; titanium, 0.12 per cent; and aluminum, 7.7 per cent. The production of the alloys is accomplished either by reduction with finely divided aluminum, together with the mixed oxides of iron, titanium, etc., or whatever metals it is desired to introduce into the alloys; or they can be produced by heating the mixed oxides in a graphite crucible in an electric furnace, using either zircon or zirkite as a source of zirconium.

#### The Cooling of Steel Ingots

In a lengthy paper before the Iron and Steel Institute (British) on "The Cooling of Steel in Ingot and Other Forms," presented by J. E. Fletcher at the fall meeting in 1918, the laws which govern the freezing and cooling of steel in metal and sand molds were discussed. The subject was dealt with under the headings of contraction and pipe in ingots, effect of variable speed of cooling, temperature gradients and contraction, and influence of cooling on crystalline structure. In regard to the first, the author urged that the phenomena of contraction and shrinkage are intimately bound up with the question of gas inclusion. The feeding of a heavy casting, for example, is accompanied by a vigorous escape of gas through the feeding head, and a so-called shrinkage cavity is thereby being filled with molten metal, the gaseous contents of the cavity being ejected through the head. In foundry practice it is safe to regard the contraction of a casting as always following the direction of the liberated gas streams as they flow towards the mass centers and feeding heads, the portions last to solidify, and to take the view that the contraction may be largely due to the escape and shrinkage of occluded gases during the freezing of the metal. Uniform contraction is promoted by placing the feeder heads at such positions as will enable the gases to escape readily, and by keeping the feeders hot and active, thus securing the filling with molten metal of the cavities which a moment before were filled with gas.

## Thread Milling Machine

A new size of universal thread miller is announced by the Smalley General Co., Bay City, Mich. This is known as the company's No. 2 miller and is designed for work of larger range and smaller diameter than the company's No. 1 machine, and is stated to be especially adapted to general use by machine shops and manufacturing plants. Quick change of speeds and pitches for various threads and the absence of loose gears are among the points emphasized.

The chucking type of machine illustrated is for use if the threads are near the end of the work. For lead screws, jack screws, worms and work where the milled surface is 4 in. or more from the end, a centering type of milling head is supplied and the work is held between centers. The bed, which is of lathe type, has the main head cast solid to insure rigidity and alignment. Under the main head are the gears driving the main spindle. They are all mounted on shafts in the cabinet leg, and so arranged that with the three-step cone 18 speeds can be obtained.

The turning speed bears a constant relation to the milling feed so that it is fast for small work and slow for large. This feature, it is pointed out, enables faces to be turned true with the thread, giving perfect alignment when screwed together and also saves an extra operation on some other machine. The only loose gears

are those required for the lead screw to change the pitch of thread milled, which is pointed out as making it possible to quickly shift from one job to another.

During the milling operation, while the work held in the chuck makes one revolution, the milling head is moved back on the ways by the lead screw a distance amounting to the pitch of the thread to be milled. This movement of the milling head is accomplished by a feed-tube device, which is pointed out as one of the unique features of the miller. Some of the advantages pointed out by the manufacturer for this device are as follows: The dragging backward action against the thread of the lead-screw prevents any backlash; the 18 in. of thread on the lead screw as against the usual 4 to 5 in. gives longer life, greater accuracy and larger production, the thread can be picked up at any time or place, as it is not necessary to wait for the split nut to come around as on a lathe; it does not use up the lead-screw when in high or turning speeds.

The capacity of the machine is given as 9 in. outside diameter and 13 in. inside diameter threads with 2-in. diameter hob. The machine will swing work 20 in. in diameter. The maximum distance from end of main spindle to end of milling spindle is 20 in. on the popular size of machine.

The Continental Supply Co., subsidiary of the Youngstown Sheet & Tube Co. for the distribution of its products in the west and southwest, will shortly open an office in New York in charge of D. Cameron. Continental Supply headquarters are in St. Louis. Temporarily its New York branch is located with the New York office of the Youngstown Sheet & Tube Co., 30 Church Street.

## Copper Tuyeres for Blast Furnaces

Many British blast-furnace managers continue to use the old cast-iron tuyere made by running cast iron around a coil of pipes bent to the desired shape. In a paper, "Copper Tuyeres for Blast Furnaces," presented at a recent meeting of the Iron and Steel Institute in London, A. K. Reese of Cardiff, Wales, dealt with a phase of modern blast-furnace practice which has still a wide field of adoption in that country. He said in part:

The copper tuyere consists of a hollow copper casting—or forging with cast copper, brass or steel outer end—with walls from  $\frac{3}{8}$  in. to  $\frac{1}{2}$  in. thick, the cooling water being led to the nose or inner end of the tuyere by a thin brass tube attached to the inlet opening, and extending to within about 3 in. of the nose,

thus insuring a good circulation of cold water through the portion of the tuyere which is subjected to the greatest heat.

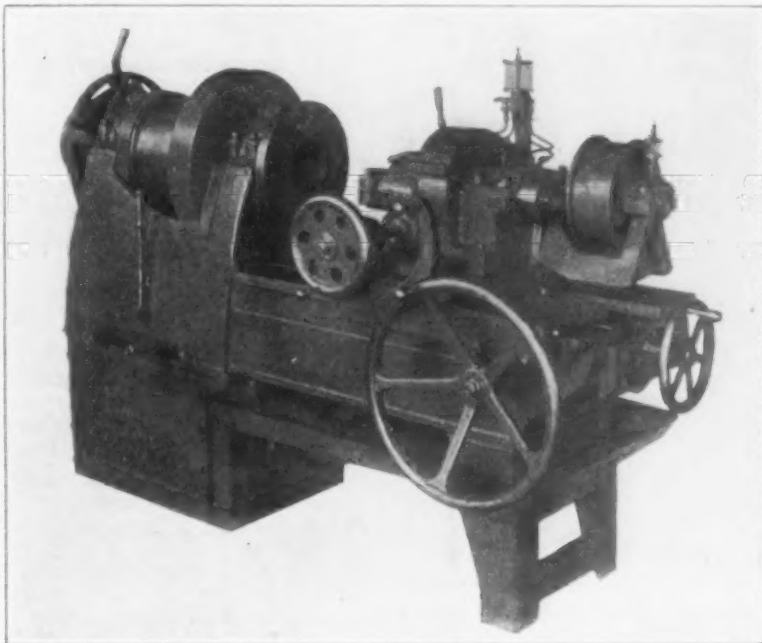
The copper tuyere is mostly used in conjunction with a copper cooler of somewhat similar shape and design to the tuyere. The cooler is set rigidly in the brickwork of the furnace wall, extending to its inner edge only, and is of such size that most of the tuyere passes through the cooler, the outer and larger portion of the tuyere making a joint about 3 in. long with a corresponding inner portion of the cooler.

The purpose of the cooler is to form a cooling protection for the brickwork about the tuyere arch, and to provide a rigid seat for holding the tuyere in place and keeping it at a fixed position in relation to the inner edge of the furnace wall and the center of the furnace, also to insure ease of removal and to do away with the use of the clay packing usually necessary where cast-iron tuyeres are used.

The advantages of these tuyeres as compared with cast-iron tuyeres fully warrant the greater first cost. They are more durable, much more quickly and less laboriously removed and replaced, and they form a much neater and more mechanical job. There are also certain serious disadvantages which are entirely removed by the use of copper tuyeres, and which are dealt with in detail in the paper. Tuyeres of rolled, hammered, or pressed copper are preferable to cast copper.

The Rotter-Speer Co., Cleveland, has been incorporated with a capital stock of \$500,000 to handle iron and steel scrap. At the head of this company is A. Rotter, scrap iron dealer, Leader-News Building, and associated with him is M. Speer, of Sharon, Pa., formerly with the Sharon Iron & Metal Co., and recently with M. Speer & Co. Mr. Rotter is president, Mr. Speer, treasurer, and D. L. Rotter, secretary. The company's offices are in the Leader-News Building, and in addition to the yard in Cleveland it has a branch office and yard in Detroit, and branch office in Sharon.

Edward J. Smith, hydraulic engineer, 30 Church Street, New York, has established offices in El Paso, Texas, in the Mills building.

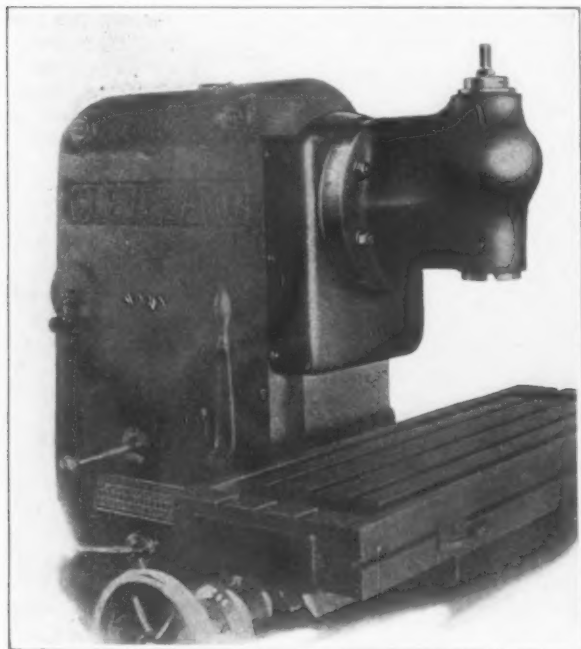


Thread Milling Machine Adapted to General Use by Machine Shops and Manufacturing Plants. A feature is the feed-tube and lead-screw device which controls the lead on the thread to be milled.

### Vertical Spindle Milling Attachment

A vertical spindle milling attachment for use on a plain or universal milling machine has recently been brought out by the Cleveland Milling Machine Co., Cleveland. Every machine shop at times has work that can be done more advantageously with a face mill on a vertical spindle, and this attachment has been designed to meet the demand of shops that do not have sufficient work of a character to keep a vertical milling machine busy.

The vertical spindle attachment will give the range of a vertical milling machine on ordinary classes of vertical milling work. It is stated that when the attachment is clamped in position on the dove-tail slide



Vertical Spindle Attachment Designed to Give the Range of a Vertical-Milling Machine on Ordinary Classes of Milling Work

of the column, which extends above the center line of the spindle, it is as rigid as if it were a part of the milling machine itself. The drive is from a gear fastened to the nose of the spindle, which in turn drives the spur gear on the horizontal shaft. The spindle is driven by large mitre gears. Gears and shafts are enclosed, and run in bronze bearings. The bearings on the spindle are the same as the milling machine spindle, and form two taper cones in opposite directions adjusted by a nut on the outside of the spindle.

The base of the head is graduated so that it may be set at any angle in a vertical plane parallel with the elevating screw. The distance from the face of the column to the vertical spindle and the distance from the nose of the spindle to the top of the table in the highest and lowest position, it is stated, cover the range of the ordinary vertical spindle milling machine.

The attachment is made in three sizes for No. 1, No. 2 and No. 3 milling machines. The principal specifications of the attachment for the No. 2 machine are as follows: Distance from face of column to center of vertical spindle,  $12\frac{1}{2}$  in.; distance from the nose of the spindle to the table, highest position,  $1\frac{1}{2}$  in.; lowest position,  $16\frac{1}{2}$  in.; cross range of machine, 10 in.; longitudinal range of machine, 28 in.; taper hole in spindle, No. 11 Brown & Sharpe; net weight, 245 lb.

### Determining Cutting Oil Formula

A device for determining the correct formula for the mixing of other oils with the company's mineral lard oil to be used as cutting oil is being distributed by the Union Petroleum Co., Philadelphia. It consists of one celluloid disk superposed over another. With the make and size of machine known, and the class of steel or other metal being cut determined, the correct formula is readily obtained.

### Steam Conveyor Costs in Ash Handling

The American Steam Conveyor Corporation, Chicago, gives comparative figures showing the relative costs of handling ashes before and after installing its steam conveyor at the Big Mine of Canada, which is owned by the Canada West Coal Co., Taber, Alberta. The boiler plant of the Big Mine contains a battery of one 500-hp. and five 150-hp. boilers operating continuously. The ash handling costs before and after the steam ash conveyor was installed are given as follows: The cost previous to installation of the steam conveyor, 24-hr. day, \$16.46. This total was made up of the wages of two ash wheelers, \$10.88, 1 teamster \$4.08, and feed for one horse \$1.50. The cost after the installation of the conveyor is given as \$4.08 which was the wages of one laborer for a 9-hr. day. This represented a saving for a 24-hr. day amounting to \$12.38.

The ashes are left on the boiler room floor in front of the boiler until the cleaning is completed and are then put into the conveyor which handles the complete cleaning in about 7 min. The boilers are cleaned every 2 hr.

The laborer acts between fire cleanings as assistant fireman and boiler room helper. The actual time the laborer spends at work handling ashes is relatively small, but if the time spent on other work was charged against that operation the savings would in that case be greater.

### Combination Disk and Emery Wheel Grinder

The grinder illustrated is a combination disk and emery wheel grinder manufactured for direct current of 110 or 220 volts, or alternating current of 220 or 440 volts, 25 or 60 cycle, two or three phase.

The machine is made with a 1-hp. or 2-hp. Westinghouse motor designed for this service. The emery wheel on the 1-hp. machine is 10 in. in diameter and the emery disk is 12 in. in diameter. The emery wheel on the 2-hp. machine is 12 in. in diameter with  $1\frac{1}{4}$ -in. face and the emery disk is 12 in. in diameter. The



Combination Grinder Equipped with Specially Designed Motor Ball and Thrust Bearings

grinder is fitted with S-K-F ball bearings and with a ball thrust bearing on the emery disk side of the motor. The speed on alternating current is 1700 r.p.m. and on direct current 2000 r.p.m. The machine is manufactured by the United States Electrical Tool Co., Cincinnati.

## GERMAN MACHINE TOOL TRADE

### An American Investigation of Conditions in the European Market

WASHINGTON, May 6—Because of reports of the plans of German machine tool manufacturers to invade European markets, the Department of Commerce has decided to send a special commissioner to Europe to study this problem. He is Alexander Luchars, publisher of *Machinery*, New York, and is expected to sail by Monday, as speedy action is necessary if the American industry is to catch up. Mr. Luchars is charged with the investigation of reports that the German manufacturers are offering their product at low prices in neutral countries, in anticipation of an opportunity to send them into belligerent countries the moment the peace treaties are signed. He is also to ascertain whether German firms are making contracts for agencies through neutral firms, with the understanding that the representation will pass to the hands of German machine tool dealers whenever peace conditions permit. Another item which he is to find out is what arrangements German firms who were active in handling American machine tools in European countries before the war are now making to secure the resumption of relations, also as to the efforts being made to secure an American market for German tools.

So far this information secured by the Department of Commerce on this subject has been fragmentary. The State Department is participating in conferences with the French Government over complaints of American firms that they are not being properly treated in the apportionment of the 136,000,000 francs of machine tool imports which the Paris authorities are permitting under a rationing scheme. Mr. Luchars is expected to take part in these conferences and to present the complaints of the American manufacturers. He will make his first stop in Paris, but will also visit Italy, Switzerland, Belgium, Great Britain, Holland and the Scandinavian countries.

### Deforest Plant Resumes

YOUNGSTOWN, OHIO, May 6.—Resumption of operations at the Deforest Sheet & Tin Plate Works of the Republic Iron & Steel Co. this week was announced, following a two weeks' shutdown for inventory. The Republic company formally took over the property May 1. Four of the eight mills at the plant are operating this week. This marks the entrance of the Republic Iron & Steel Co. into the sheet steel trade. At the Brown-Bonnell finishing mills of the Republic company only four units are in commission and the rest of the plant is running about 50 per cent.

The plate mill of the Youngstown Sheet & Tube Co. has suspended. Operations in other departments continue as usual, averaging from 50 to 60 per cent. The Brier Hill Steel Co. will maintain its open-hearth works on a 70 per cent schedule, in anticipation of improved operations at the sheet and plate mills. The 132-in. plate mill is still idle.

At the Sharon Steel Hoop Co.'s Haselton works, six mills resumed Monday and it was expected to get the others in operation before the end of the week.

### Buys Spot Coke

UNIONTOWN, May 5.—Spot coke was virtually removed from the market last week as the result of a large furnace interest buying up all the loose tonnage of Connellsville coke of standard quality in the Connellsville region. That clean-up of the unsigned coke has but one exception, so far as is known, one large independent operator declining to sell a considerable quantity of coke at the prevailing price. As a result of the "clean-up" purchase, which was brought about by mining troubles, at the mines of the furnace interest, the Connellsville region may now be said to be

level with demand and any consumer wishing any quantity of coke must wait until it is made. There is still a considerable tonnage of high sulphur coke on the tracks.

An immediate effect upon the rather extensive activity in spot coke was a stiffening of the market, which although it may be temporary, has raised the price of prompt delivery coke of standard quality to \$4, the figure the operators claim is the "dead line" with present costs prevailing. Before the furnace interest entered the open market, shipments of coke were sold from \$3.25 to \$4.

### Important Change in Order Affecting Payment of Commissions

WASHINGTON, May 6—President Wilson has authorized a radical change in the covenant which he ordered inserted last year in all war contracts forbidding the payment of commissions to brokers, and invalidating contracts containing them. Ever since that order went into effect there has been much agitation for its removal, because it interfered with legitimate business operations in many lines. Some time ago, the Railroad Administration announced that it had received authority from the President to modify the clause. Now Attorney General Palmer has sent a letter to all the Government departments and purchasing agencies detailing the proviso to be inserted in future contracts, which will open the way for the payment of legitimate commissions.

The following is the text of the identical letter sent by the Attorney General to the other departments:

"I have the honor to call your attention to the covenant intended to prevent the payment of illegal commissions which, by direction of the President, is now being inserted in all Government contracts. The President has now authorized a modification of this covenant to the end that it may not invalidate contracts obtained through bona fide commercial representatives or agencies by an established business process everywhere recognized. With his approval, therefore, I have prepared a proviso which he authorized to be attached to all such covenants as follows:

Provided, however, it is understood that this covenant does not apply to the selling of goods through a bona fide commercial representative employed by the contractor in the regular course of his business in dealing with customers other than the Government and whose compensation is paid, in whole or in part, by commissions on sales made, nor to the selling of goods through established commercial or selling agents or agencies regularly engaged in selling such goods.

"I think this proviso will meet all just objections that have been made to the covenant now in use."

### Information on Canadian Factory Sites

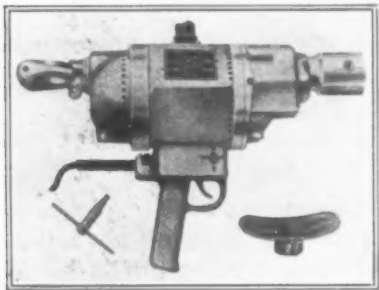
To aid American manufacturers find suitable locations for Canadian branches, Heaton's Agency, 32 Church Street, Toronto, publisher of Heaton's Annual, has established an industrial department, which has compiled for the asking detailed information on shipping facilities, power rates, labor conditions, raw materials, existing industries, factory sites, municipal inducements offered, etc., for cities and towns of commercial importance in Canada. Attention is called to the point that with a British Imperial preferential tariff assured, it will be necessary to manufacture in Canada for the British market.

The Factory Products Corporation, 2 Rector Street, New York, with which the J. G. White Engineering Corporation is associated, has issued a booklet explaining the corporation's facilities for rendering export and import service to manufacturers.

Dean Brothers, Indianapolis, manufacturers of steam pumps, have opened an office in New York at 141 Broadway. H. Meachem has been appointed district sales manager.

## Portable Electric Drill

The  $\frac{1}{2}$ -in. portable electric drill illustrated, is manufactured by the Black & Decker Mfg. Co., Baltimore. It is equipped with a  $\frac{1}{2}$ -hp. motor, has a full load current consumption of about 700 watts, and a no load



This  $\frac{1}{2}$ -In. Portable Electric Drill Weighs 21 $\frac{1}{2}$  Lb.

speed of 600 r.p.m. The housing is of aluminum alloy, completely enclosing the motor and gears, and the total weight of the machine is 21 $\frac{1}{2}$  lb. Like other drills made by this company, it has a pistol grip and trigger switch, also an indicator which serves to indicate

when the switch is on and when it is off.

The electric motor uses direct current or 25, 40 or 60 cycle alternating current, and will operate from any two wires of a three phase circuit. The motor is air-cooled by a centrifugal fan mounted on the armature shaft. The gears operate in grease in a separate grease-tight compartment.

The commutator end cover is separate from the armature shaft bearing and is removable for inspection and adjustment of brushes. This also eliminates the possibility of the armature shaft binding in the bearing, in case the end cover is accidentally distorted by dropping the drill or by exerting excess pressure on the feed screw.

The machine is made for 32, 110 or 220 volt current.

## Yale & Towne Semi-Centennial

Under the title "Fifty Years of a Successful Industry, 1868-1918," the Yale & Towne Mfg. Co. has published a pamphlet of 76 pages as a semi-centennial souvenir. In the foreword it is said that the booklet outlines the biography of a modern industry. As in all such commemorative publications, the text tells but a part of the story. The greater story runs between the lines. The linking of the two names Yale and Towne in the fifty years that they have had so prominent a place in American industry suggests a long association of the two men. The fact is, however, that their partnership lasted less than three months, beginning in October, 1868, and being terminated by the sudden death of Linus Yale, Jr., Dec. 25 of that year, at the age of 47.

Yale locks date from about 1840, when Linus Yale, Sr., began the manufacture of pin-tumbler locks of great mechanical excellence at Newport, N. Y. The son, Linus Yale, Jr., became the leading lock expert of his day and made many important contributions to the art. The development of the Yale & Towne industry for the greater part of the 50 years was due chiefly to the business sagacity, the mechanical ability and organizing genius of Henry R. Towne. When Mr. Towne first became associated with Linus Yale, Jr., the latter employed 35 men. The number of employees to-day is 4500, and 45,000 different products are manufactured, requiring 1,500,000 machining and manufacturing operations. The Stamford, Conn., plant covers an area of 25 acres and there is the same area of manufacturing floor space, or 1,100,000 sq. ft.

The pamphlet dwells most interestingly on the careers of the heads of the business and traces the development of the various lines of manufacture. There are several plant views, but the reader is most attracted by the personal phases of the story. In the sketch of Mr. Towne's career prepared by his associates reference is made to his efforts in bringing about better relations between competing manufacturers. While carefully refraining from combination he did much to establish friendship based upon honest and healthy competition between manufacturers in the hardware trade, in place of the attitude of distrust and sus-

picion which had been common. Mr. Towne's activities in the promotion of public and business interests in New York are well known. Organizations for the promotion of industrial and commercial development have had his strong support. He was president of the American Society of Mechanical Engineers in 1888-89, and was chairman of the large body of American engineers representing three societies which visited Europe in 1889 as guests of the civil engineers of Great Britain and France. He was one of the first to recognize works management as a modern art entitled to a first place in the thought of industrial engineers.

## New and Improved Equipment Demonstrated at Brooklyn Industrial Exposition

The industrial exposition of Brooklyn manufacturers held under the auspices of the Brooklyn Engineers Club, April 28 to May 3, at the Twenty-third Regiment Armory, Brooklyn, N. Y., is said to have been the first general exposition of manufactures sponsored by technical society. Over 50 local manufacturers of metal products exhibited, and displayed samples ranging from a small screw machine product or stamping up to heavy machinery including a 21-in. naval torpedo and a 300,000,000 candlepower searchlight.

A new type sensitive tapping or drilling machine, readily convertible from one operation to the other by hand-setting a pin carrying spiral gears so as to mesh with the proper pinion, was shown by the Fulton Foundry & Machine Co., 21 Furman Street, Brooklyn. The Adriance Machine Works, 80 Richards Street, Brooklyn, exhibited its new flue cleaner, Bate patent, in which the cleaning is done by blowing only sections of pipes, thereby not interrupting the draft. The Keller Mechanical Engraving Co., 70 Washington Street, Brooklyn, operated its latest model die-sinking machine and a new type grinding machine. The V. & O. Press Co., Dry Harbor Road, Brooklyn, displayed a thread rolling machine equipped with a new type automatic feed and knockout, and also a power press with automatic brake release for quick operation. An improved form of heavy vapor flue was shown on its ovens by the Gehnrich Indirect Heat Oven Co., 60 Franklin Avenue, Brooklyn. Arrangements are being made to hold this exposition again next year.

## Westinghouse Scholarships as War Monuments

E. M. Herr, president Westinghouse Electric & Mfg. Co., Pittsburgh, has announced the establishment of four technical scholarships by his company to commemorate the part played during the war by its employees. Selection of the candidates will be determined by annual competitive examination conducted by the company's educational department under the direction of a committee consisting of three vice-presidents, who will also prepare the regulations and all details of administration. Each scholarship carries with it an annual payment of \$500 and the student may take any course of engineering at whatever school he selects having the approval of the committee. Scholarships are for one year only, but will be continued for four full years provided the student maintains the standards required by the institution he has elected to attend. The number of new scholarships will be four each year.

The Booth-Hall Co., designer and builder of electric furnaces, has removed its executive and sales offices to rooms 1007-1008 Hearst Building, 326 West Madison Street, Chicago. This change was necessitated by new arrangements made in connection with the manufacture of the company's electric furnace equipment.

General offices of the Pittsburgh Annealing Box Co. and the Independent Bridge Co., identified interests, have been moved from the North Side, Pittsburgh, to the May Building, that city.

Over 1,000,000,000 francs of orders were placed at the fair at Lyons, France, which was held the first two weeks in March, according to the *Review* of the American Chamber of Commerce in France.

## Large Increase in German Pig Iron Prices

At the meeting of the German Pig Iron Syndicate on March 26, at Essen, which was attended by representatives of the government and of workmen's delegates, the ironmasters stated the reasons which compelled them to make a further considerable increase in the prices of pig iron, says the *London Ironmonger*. These were as follows: The high wages, the freight rates, which have been increased by 60 per cent from April 1, 1918, the further rise in the price of fuel and the increase of all working expenses and costs, added to which the production of the works is restricted. Prices were last increased by an average of 85m. per ton for January and February of this year, but the present increase averages 125m. per ton. The advances are as follows: Hematite, 107m.; German foundry iron No. 1 and 3, 147m.; Siegerland steel-making iron, 124m.; spiegeleisen, 145m.; and Luxemburg foundry iron, 141.50m. The new prices are as follows, as compared with the first quarter of 1919 and July, 1914:

	April-June, 1919	Jan.-March, 1919	July, 1914
Hematite .....	421.50	314.50	78
Foundry iron No. 1 .....	397	250	74.50
Foundry iron No. 2 .....	396	249	69.50
Siegerland steelmaking iron .....	364	240	69.50
Spiegeleisen .....	404	259	79
Luxemburg foundry iron .....	356.50	215	57.50

In accordance with the wishes of consumers, the syndicate has fixed the prices from April 1 for three months in order to allow for a firm basis for calculation, but the syndicate reserves the right of making a further increase if the price of fuel and ore go up again. On the other hand, the prices are to be reduced if the prices of fuel and ore decline during the current quarter, and also if the producing costs are reduced as a result of a fall in wages. At the meeting of the Stahlwerks Verband it was decided not to increase the prices of steel for the present, but the question will be discussed at the meeting on April 10, and a general rise is expected.

It was estimated, says the *London Iron and Coal Trades Review*, that prices would then be advanced by at least 100 marks (\$25) per ton. In the meantime some of the steelmakers have taken the matter into their own hands. The Hoesch Co., for instance, has already raised prices for the second quarter by 115 marks (\$28) per ton. On this basis bars stand at 550 marks (\$130), plates at 615 marks (\$150), medium sheets of  $\frac{1}{8}$ -in. and thicker at 710 marks (\$170), and light sheets of less than  $\frac{1}{8}$  in. at 725 marks (\$175).

With regard to the renewal of the Verband, it was stated that the government considers it imperative that it should be renewed on the present basis.

## British Iron and Steel Exports in March Still Small

Exports of iron and steel from Great Britain in March, 1919, are officially reported as 159,529 gross tons, excluding iron ore and including scrap. This compares with 109,939 tons in February, 1919, and with 118,146 tons in March, 1918. The average per month in 1915, 1916 and 1917 was 220,670 tons, 279,695 tons and 195,466 tons respectively. The pig-iron exports were 11,564 tons against 15,842 tons in February, 1919; in March, 1918, they were 24,499 tons. Ferromanganese exports were 9753 tons last March as against 5400 tons in March, 1918.

The outgo of steel bars was 18,403 tons, or about 4000 tons more than March or February, 1919, while that of rails was 3359 tons as against 3691 tons in March, 1918, and only 762 tons in February, this year. The March tin-plate exports this year were 22,185 tons as compared with 13,640 tons in February, this year, and with 19,662 tons in March, 1918. The exports of steel plates not under  $\frac{1}{8}$  in. thick were 26,992 tons last March against 14,825 tons in February, this year, and 4798 tons in March, 1918.

Imports of iron and steel in March, excluding iron ore and including scrap, were 34,956 tons, as compared with 46,247 tons in February, this year, and 24,673 tons in March, 1918. The monthly averages in 1915, 1916,

and 1917 were 107,550 tons, 64,404 tons and 41,401 tons respectively.

Iron ore imports last March were 404,899 tons, of which 237,358 tons came from Spain. These imports in March, 1918, were 562,673 tons, of which 366,985 tons were credited to Spain. Pig iron imports last March were 14,409 tons as against 8597 tons in March, 1918. They were 27,363 tons in February, this year. Ferro-alloy imports, largely ferrosilicon, were 286 tons last March, as compared with 2023 tons in March, 1918.

Manganese ore imports were 38,157 tons in March, this year, as compared with 27,766 tons in March, 1918, and with 24,031 tons in February, this year.

## Electric Smelting of Canadian Iron Ores

The Department of Mines of British Columbia has recently published Bulletin No. 2, 1919, containing a report on "The Commercial Feasibility of the Electric Smelting of Iron Ores in British Columbia," by Alfred Stansfield, professor of metallurgy, McGill University. Mr. Stansfield concludes that, on account of the high freight rates from existing centers of production, there is a possibility of the commercial production of electric pig iron, in spite of the high cost of the electric furnace process. The commercial feasibility of such production depends largely on how much the price of imported pig iron is likely to decrease from the present high levels. With prices at pre-war levels it would be impossible for the electric furnace to compete.

There is enough iron ore of a good grade to supply the local market for many years to come. Charcoal made from waste wood can be used to supply the necessary carbon, and either existing hydro-electric developments or new projects can supply power. On account of the small local demand for pig iron, if a plant was built, it should be equipped to make other products as well, such as steel castings, small rolled sections, and ferroalloys. Investigation is also recommended of the process in which the ore is crushed to a powder and subjected to other preliminary treatment before being charged into the furnace.

## Large Lake Ore Movement in April

Iron-ore shipments from the Lake Superior region in April, 1,412,239 gross tons, were much larger than in April 1917, due almost entirely to the open season following a mild winter. The following table gives the shipments from the various ports in the last five years in gross tons:

	April, 1915	April, 1916	April, 1917	April, 1918	April, 1919
Escanaba .....	49,307	398,214	190,407	.....	71,417
Marquette .....	4,438	53,258	.....	10,708	.....
Ashland .....	43,949	147,852	.....	.....	147,358
Superior .....	87,175	211,340	21,125	99,562	101,736
Duluth .....	174,989	538,281	.....	56,991	794,056
Two Harbors .....	143,974	309,466	.....	68,609	297,684
Total .....	503,832	1,658,411	211,532	235,870	1,412,239
Decrease from 1916 .....	.....	.....	1,446,879	.....	.....
Increase over 1917 .....	.....	.....	.....	24,338	.....
Increase over 1918 .....	.....	.....	.....	.....	1,176,369

The April total for 1919 was exceeded only in April, 1916.

## German Coke Output During the War

The German output of coke in 1916, 1917 and 1918 was over 33,000,000 metric tons each year, or in excess of the 1913 output, which was 32,167,000 tons. A recent issue of *Glückauf* publishes tables of the coal, coke and briquet outputs which have been reproduced in the *London Iron and Coal Trades Review*. The coal and coke output in the last six years was as follows:

	Coal	Coke
1913 .....	191,511,000	32,167,000
1914 .....	161,535,000	27,324,000
1915 .....	146,712,000	26,359,000
1916 .....	158,847,000	33,923,000
1917 .....	167,311,000	33,629,000
1918 .....	160,508,000	33,411,000

The Ruhr district contributed nearly 29,000,000 tons of the total coke output in 1917 and 1918.

# English Workers Demand Reform

## Serious Unrest Due to Strain of War and Other Causes—Strong Sentiment in Favor of Co-operation of Labor and Capital

WASHINGTON, April 29.—Less than 200,000 of the 14,000,000 workmen in Great Britain own their own homes, according to an interesting report which has been made by the Employers' Industrial Commission of the Department of Labor. This commission has returned from a visit to England and has filed with the department an exhaustive account of the unrest it found in that country. It has a vital bearing on the present consideration of American employment problems.

"Interviews with many of the workmen," says the report, "tended to indicate that 'unrest' is a rather inadequate term. There are many intimations of 'direct action' and a complete overturning of the present social structure. But we believe the more extreme demands are largely limited to a class which has been thinking and talking along these lines for years.

"The issue, however, is squarely drawn on the demand of the working people to have a better industrial day. They seek not merely small non-essentials, nor commonplace essentials, but a real step forward in their conditions of life and labor.

"We can not report that we have found any panacea for industrial unrest. For instance, the specially generous treatment of employees, which is possible in connection with exceptional types of highly profitable enterprises, might be impossible in the case of industries engaged in closely competitive operations.

"The present unrest among the workers is ascribed by different authorities to many separate causes—that most frequently mentioned as the *immediate* cause is the strain of four terrible years of exhausting war, necessitating the most intense labor and excessively long hours for the worker.

"Among other alleged causes is a feeling that the worker does not receive his proper share of the combined product of capital and labor. This is universally voiced by the workmen whom we have interviewed.

"There seems to be a marked disposition among the 'rank and file' of workers to criticize the present union system because it denies the workmen in the shop an opportunity promptly to rectify grievances, irrespective of their particular craft union. The object of the shop steward or shop committee movement appears to be to rectify this by constituting a shop organization capable of dealing with common grievances. At the present moment there is rather a widespread feeling among the workmen that the officials of the labor unions have become detached from the atmosphere of the shop and not in proper sympathy with the workmen. There is a marked disposition among the workmen to be represented in the national councils by actual workers.

"One can not listen to their grievances and hear the stories of their troubles, as voiced by the more intelligent workmen, who are of a very superior type, without being impressed with their sincerity. Periods of unemployment frequently place them in debt, from which it requires years of strenuous effort and self-denial to recover. Many find themselves unable to obtain employment during their later years, after a lifetime of constant industry; their wages afford slight means for recreation."

### Use of American Machinery

Concerning the use of American machinery in British plants the commission reported:

"The various industrial plants inspected indicated that the equipment and organization of the British plants compare favorably with corresponding plants in the United States. It is an interesting circumstance that a very large steel-producing plant in course of construction contained many trains of machinery manufactured in the United States, and the balance of its equipment was built in England under license from and

under the supervision of the foremost American designers. Plants developed wholly under British auspices, as a rule, represented a very high state of industrial development."

### Conclusion of the Commission

In its conclusion the commission submitted the following findings:

1. Employees in Great Britain generally recognize the desirability of bargaining collectively with labor.
2. Employers nearly all agree that collective bargaining should always be undertaken between associations of employers and the regularly established well-organized trade-unions.
3. Most employers freely recognize the right of labor to organize; they regard organization as greatly contributing to the stability of industry.
4. Employees in Great Britain are divided in sentiment shading from those who want to maintain the trade-unions along the regularly established so-called "constitutional" lines to ultraradical socialists.
5. Employees are nearly a unit, however, in expressing opposition to the use of force.
6. Employees of the ultraradical type look askance at collective bargaining and organizations of labor and capital.
7. Employees of the more conservative type (and to your commissioners they appear to represent the vast majority of British workmen) are largely in accord with employers in the desire (1) to head off labor unrest at this period; (2) to strengthen the unions by holding members under control; (3) to increase production for the sake of the nation, workmen included—with no restriction on output except as it affects the health of the worker; (4) to leave control of business policies in the hands of those managing the business.
8. Government officials appear to be uniformly of the opinion that the Government should function in labor unrest only as an absolutely last unavoidable resort.
9. In general the Government, and most employers and conservative employees appear to be agreed:  
That the spirit of co-operation between labor and capital is highly desirable.

That the spirit of conciliation is important for the benefit of the employer in stabilizing his business and for the benefit of the employee in preserving his regularly organized unions.

That in collective bargaining the right-minded employer will not attempt to return to the pre-war industrial era, and that the right-minded employee will not attempt to crowd his demands to the point at which the stimulus for private business enterprise would disappear.

### Troubles in Detroit

DETROIT, May 5.—Less than 5 per cent of Detroit's 284,000 industrial employees were on a strike May 1, and of this 12,000 more than half had been out for several days. Little disorder marked the day, two parades being allowed in the residential sections, with no display of red flags. Earlier in the week there were two near-riots, resulting in injuries to a number of men.

Employees of the Wadsworth Mfg. Co., which makes bodies for the Ford Motor Co., attacked men leaving work at the plant Tuesday. Out of 900 men still engaged at the plant, 60 were injured so that they required medical treatment, and the purchasing agent of the plant suffered a fractured skull and other serious injuries.

The company normally employs 2000 men. The employees are striking for recognition of their grievance committee, selected from the entire union.

At the L. A. Young Industries, Inc., Russell and Westminster avenues, Detroit, 500 men, also members of the Automobile, Aircraft and Vehicles Union Workers of America, Local No. 127, started a riot at the plant. The police arrested 10. About 1000 employees of the Young plant, which manufactures wire springs, were on a strike demanding the re-installment of two women employees whose discharge was made necessary

because rest room facilities required by law were not available in their department. They will return to work Monday without concessions.

Strikes are also in progress at the Detroit Brass Works, Detroit, and the Liberty Starter Co., Detroit. Foundries are suffering from a strike of molders, and building trade unions are also striking.

Belief is expressed by industrial leaders of Detroit that the strikes will not spread widely nor affect the larger plants. They point out that the grievances in all cases are minor ones that can be settled rapidly. Employers are acceding to reasonable demands, and many plants voluntarily raised wages during the past month.

### President Campbell Defines His Position

YOUNGSTOWN, OHIO., May 6.—James A. Campbell, president Youngstown Sheet & Tube Co., announced this week, in reply to inquiries, that he was opposed to any reduction in wages at the present time because workers are suffering what is equal to a cut by reason of intermittent employment. "If the Government Railroad Administration or the buying public insists on lower prices than those ruling at present, which average about \$12 per ton below the prices fixed by the Government for finished steel products during the war, then there necessarily will have to be a reduction in wages or the mills will cease to operate, because a number of finished articles are now selling at less than cost of production and others at only slight profit, and mills cannot continue to operate at any lower prices on an average than those prevailing at present. I do not believe that any governmental agency intends to try to force prices so low as to interfere with the wages of workmen, but when it is acquainted with all the facts I think it will be willing to place orders on such a basis of prices as will not interfere with the wages of employees."

### Women Workers in Germany

WASHINGTON, May 6.—The employment of women in the German metal working industries increased enormously during the war. Trade Commissioner Arthur H. Redfield at The Hague has sent to the Bureau of Foreign and Domestic Commerce some interesting statistics concerning this growth. The following table compiled by the Metal Workers' Trade Union of Germany details the number of women employed in the plants where this union was represented, as well as their percentage of the total number of workers:

Year	Total Number Employees	Female Employees	Per Cent of Females
1911	196,120	12,968	6.6
1917	387,612	65,138	16.8
1918	1,079,455	288,362	26.7
1917	1,920,423	624,688	32.5

The number of female members of the German metal trade unions doubled in 1917.

### Increase in Employees in Three Years

WASHINGTON, May 6.—The iron and steel industry continues to lead the industries of the country in the increase in the number of men on its payroll and the amount of that payroll, according to the statistics compiled by the Department of Labor.

These figures are made up by using 100 as the index figure for the employees and their total wages in 13 selected industries, for January, 1916. On this basis the number of men on the iron and steel payrolls was represented by the index number 159 in January, 1919, and 144 in February, 1919. The amount of the payroll was 265 in January, 1919, and 250 in February, 1919.

On the same basis the figure for automobile manufacturing was 108 in January, as well as February, 1919, but the amount of the payroll increased from 159 in January to 164 in February, 1919. The index figure for car building in January was 122 and in February, 109, while the payroll total fell from 234 in January, 1919, to 197 in February.

These industries, as well as all others, showed a

decided decrease both in the payroll total as well as the number of men on the payrolls from the figures for December, 1918 (THE IRON AGE, April 15, 1919, p. 1017). In practically all of them the downward tendency began with December.

### In the Labor World

The molders at the Adamson Machine Co., Akron, Ohio, have returned to work after being on strike for three weeks, a settlement having been effected on a basis of 75c. per hr., an 8-hr. day and an open shop.

Because 400 of the 600 employees of the Hamilton Beach Mfg. Co., manufacturer of electrical appliances, Racine, Wis., rejected a wage advance offered them, the plant has been closed for an indefinite period. This action followed uncompromising demands by machinists and polishers, the former asking a 10 to 20 per cent increase and the latter an advance from 67½c. to 80c. per hr.

Machine tool plants at Madison, Wis., are still idle on account of a machinists' strike. Machinists at Rockford, Ill., threaten to strike in sympathy with furniture factory employees who have been out for some time and have been unable to gain their demands.

The molders in union jobbing foundries in Chicago were granted 80c. an hr. and an 8-hr. day, effective for a year commencing May 1. Their demands were for a \$7 day and a 44-hr. week. Reports received by the National Metal Trade Association regarding the general labor situation in Chicago are to the effect that there is a feeling of unrest throughout the industry, which, however, has not been translated into actual disturbances.

The labor situation at Youngstown, Ohio, was made worse May 1 by a strike of about 4500 journeymen in ten building trades crafts, including sheet and metal workers, whose demands for wage increases were refused by the Builders' Exchange. Conciliators from the Department of Labor at Washington were sent there to adjust the differences. The men asked increases ranging from 15 to 25 per cent.

At Birmingham, Ala., indications point to additional wage reductions without friction. In one instance it will be the withdrawal of a voluntary bonus. In a number of wage adjustments satisfactory results have attended man-to-man conferences between the plant managers and the employees. One large concern has gained favor with its employees by establishing monthly conferences with duly-elected representatives from the different departments.

Machinists and boiler-makers at San Francisco, Cal., have been granted a 44-hr. week.

The Gem City Stove Co., Dayton, Ohio, has granted employees in the metal polishing department an 8-hr. day.

Employees at the plant of the Wolf Co., Chambersburg, Pa., manufacturer of flour mill machinery, etc., declared a strike on April 30, holding that the terms arranged by the National War Labor Board in settlement of a recent strike at the plant had not been placed into effect.

More than 15,000 Willys-Overland Co. employees received \$400,000 in checks recently in the company's first distribution of the profits under the 50-50 profit sharing plan announced last January. The \$400,000 represents 8 per cent of the wages paid during the first quarter of the year. Of the number sharing, 9843 are at the plant at Toledo, Ohio, and the others are scattered throughout the country, notably at Elyria, Ohio, and Elmira, N. Y.

The convention of International Brotherhood of Blacksmiths, Drop Forgers and Helpers, recently held at Indianapolis, empowered the general officers to suspend operations in the railroad shops of the country and in Canada, if the alleged practice of permitting other crafts to infringe on jurisdictional rights by representing to the bosses that certain work belongs to those other crafts, is continued. The organization decided not to join in any nation-wide strike in protest against a nation-wide prohibition.

## UNIFORM BILL OF LADING

### Railroads Required to Use New Plan After August 8—Matters of Controversy

WASHINGTON, May 6.—After seven years of investigation, the Interstate Commerce Commission has ordered the railroads of the country to put into use a uniform bill of lading on Aug. 8, 1919. The commission has prescribed the form for this bill. The chief restriction in the proposed bill is its restraint upon the efforts of railroad companies to limit their liability as to the amount of recovery in case of damage to property. The commission applies the Cummins law with vigorous exactness that the companies may not contract for a limitation of their liability except where reduced rates are based directly upon this limitation.

One of the controversies that arose in the law hearings on the measure was that involved in the railroads' liability for property shipped in open cars. This is of particular interest to the iron and steel industry because it involved shipments of machinery, engines, agricultural implements, traction engines, structural steel and other forms of fabricated steel. Even automobiles have been extensively carried in open cars because of the general shortage of equipment.

#### Use of Open Cars

The railroad companies demanded the retention in the new bill of lading of the following clause which has appeared in the railroad bills in the past:

When in accordance with general custom on account of the nature of the property, or when at the request of the shipper the property is transported in open cars, the carrier or party in possession (except in case of loss or damage by fire, in which case the liability shall be the same as though the property had been carried in closed cars) shall be liable only for negligence, and the burden to prove freedom from such negligence shall be upon the carrier or party in possession.

To the retention of this provision the shippers made drastic objection. They offered the following as a substitute:

Property not customarily transported in open cars, when transported in open cars at the request of the shipper, shall be at the owner's risk as to loss or damage resulting from the use of such open car, provided such loss or damage could not have been prevented by reasonable care by the carrier or party in possession; provided further, however, that in the case of loss thereof or damage thereto by fire, the liability of the carrier or party in possession shall be the same as if the property had been carried in a closed car, and the burden to prove that the carrier exercised reasonable care shall be upon the carrier.

#### Conclusion of Commission

"With respect to the evidential facts and conditions," says the conclusion of the commission, "it is to be observed that certain kinds of goods may, and of necessity must, be transported in open cars. Carriers commonly hold themselves out to transport such goods, and they must therefore receive and transport them when offered for shipment. In the absence of statutory prohibition, it seems, the carrier may stipulate for a limitation of its liability in receipt of goods so transported except, of course, that it can make no stipulation for exemption on account of loss or damage caused by its own negligence, and under the law, when a consignor of goods agrees that they may be loaded and transported in open cars, the carrier, in the absence of negligence on its part, is not liable for any damage caused to the goods by their being so loaded and transported. But the carrier must exercise ordinary care and diligence even when the shipper agrees to or requests the transportation in open cars.

"We are of opinion that the exemption stipulated for in the present and proposed bill is too broad and too greatly favors the carrier to be entirely just and reasonable. Moreover, we think that it falls within the provisions of the Cummins amendment so far as it seeks to exempt the carrier from the liabilities with which it would be charged under the common law. To that extent it would be invalid and void. To the ex-

tent that the carrier would escape liability at common law, stipulation is unnecessary. We shall therefore not approve either the rule proposed by the carriers or the substitute offered by the shippers for inclusion among the conditions."

#### Fixing Property Value

Another issue raised by the railroad companies concerned the method of fixing the basis for the actual property value. For this purpose the railroad companies proposed the following clause:

The amount of any loss or damage for which any carrier is liable shall be computed on the basis of the actual value of the property at the place and time of shipment under this bill of lading, including the freight charges, if paid, and where the actual value of the property has not been required to be specifically stated by the shipper in this bill of lading, such actual value shall be arrived at from the bona fide invoice price, if any, to the consignee.

Again the shippers objected and offered the following substitute:

The amount of any loss or damage to property, or loss in damage due to delay in the delivery thereof under this bill of lading for which the carrier is liable by law, shall be the full actual loss, damage, or injury, including freight charges if paid.

The commission ruled that the effort to limit the damages was "superfluous so far as concerns the transportation of property shipped under rates dependent upon declared or agreed values, and unlawful and void in respect of all other property." It therefore directed its complete elimination from the bill of lading.

The proposed bill of lading is to cover domestic shipments. The commission also approved a draft for an export bill of lading, declaring that it has authority over such traffic, from an inland point in the United States to a point of export even though the transportation to the port is performed wholly within the confines of the State in which it originates and whether the traffic be carried on local or through bills of lading. It ruled, however, that the Cummins amendment concerning the limitation of liability does not apply to traffic to a non-adjacent foreign country.

### Algoma Steel Corporation Output

A considerable increase in its iron and steel output for the nine months ending March 31 last is shown by a statement of the Algoma Steel Corporation. On the other hand, the production of coal and limestone was somewhat less. The net earnings of the Steel Corporation shows a substantial increase over the corresponding nine months of the last fiscal year. During the last three months new orders for rails and other materials have been very light. All outstanding contracts for munitions steel have been satisfactorily adjusted. During the period referred to, 290,334 tons of finished material were produced as compared with 211,452 for the corresponding period last year. Business in northern Ontario remains unsettled, but the Algoma Central and Algoma Eastern Railways report a fairly good showing. Reductions in staff and expenses have been made to meet, as far as possible, the slackening of business, which it is hoped will be of short duration. The output of iron, steel, ore and coke was as follows:

	For 9 Months Ending March	For 9 Months Ending March
	31, 1918	31, 1918
Magpie ore .....	156,732	116,806
Coke .....	330,063	288,993
Pig iron .....	280,664	220,352
Steel ingots .....	369,848	362,905

The Joseph Dixon Crucible Co., Jersey City, N. J., announces the removal of its Philadelphia sales office from 1020 Arch Street to Rooms 801 and 802 of the Finance Building, South Penn Square, under the able management of W. G. Stringer, who entered the employ of the Dixon company in 1898 and succeeded W. J. Coane as the Philadelphia district sales representative in 1912.

## Gantry Crane with Movable Cantilever

The gantry crane illustrated shows how a special condition was met at the plant of the Union Gas & Electric Co., Cincinnati. The location of the large gas holder made it impossible to cover the entire area to be served, with a standard gantry crane or with one having a fixed cantilever. To get around this difficulty a movable cantilever was constructed.

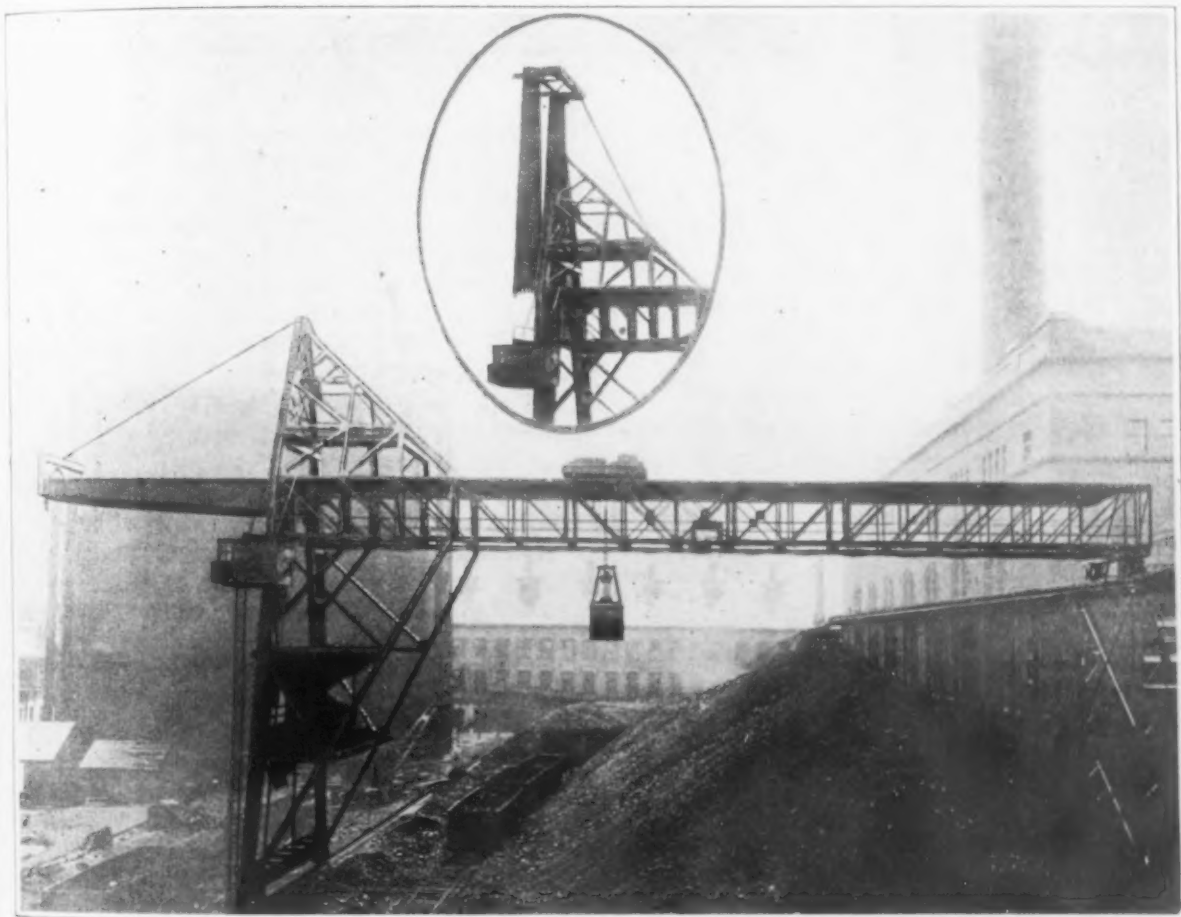
The crane has a span between the rails of 138 ft. 9 in. and an effective cantilever of 35 ft. The extreme length of the cantilever is 43 ft. 9 in. It is arranged to raise and lower by means of a lifting mechanism located on the inside of the leg above the crane girders. The overall height of the leg is 97 ft. 3 in.

The trolley is fitted with two hoists for operating a 5 cu. yd. Orton & Steinbrenner clamshell bucket.

## Mechanical Engineers' Spring Meeting

Industrial research is to be the leading subject of the spring meeting of the American Society of Mechanical Engineers to be held at Detroit June 16-19. One session will be on the subject of industrial relations with several addresses by men of national reputation. This session will constitute a symposium by leading organizers on the factors dominant in the labor situation, with an interchange of views as to what must be done to assure industrial peace. Other sessions will be of a miscellaneous technical nature and will include a discussion of powdered fuel and oil fuel.

The committee on aims and organization will make a preliminary report on its findings as to the sentiment of engineers from different parts of the country as to what should be the controlling elements in an en-



The Location of the Gas Tank Made a Movable Cantilever Necessary

Each hoist is fitted with a 100 hp. General Electric motor, 550 volts direct current, and the bucket has a lifting speed of 320 ft. per min. The trolley is traveled by a 25 hp. motor having a speed of 400 ft. per min. The bridge is operated by a 68 hp. motor and travels 150 ft. per min.

Attached to the crane leg is a 250-ton capacity Orton & Steinbrenner crusher for crushing the coal as the bucket delivers it from the storage pile, after which the coal is conveyed by a chute into dump cars and taken to the power house.

The crane was designed, built and erected by the Whiting Foundry Equipment Co., Harvey, Ill.

The American Tube & Pipe Bending Co. has been organized for the purpose of furnishing bent boiler tubes for replacement purposes for any make of vertical water tube boiler. The company is now installing machines designed for bending the tubes cold. A. Wasser, secretary and treasurer, and active head of the company, was connected with the Erie City Iron Works for thirteen years, both in their factory and in their Pittsburgh sales office.

gineer's work under present conditions, what constitutes engineering as a profession and what are the really important functions of an engineering society in its service to engineers and the public.

## Chicago Meeting of the Mining Engineers

The American Institute of Mining and Metallurgical Engineers will hold its convention in Chicago, Sept. 22 to 26. This meeting promises to be one of decided importance to the industry, as subjects of concern in iron and steel will be under discussion. In addition to the technical program excursions are being arranged to the steel mills at Gary, the oil refineries at Whiting, metallurgical plants at East Chicago and North Chicago, and to the La Salle district where the cement, coal and zinc industries are represented.

The Messer Welding Supply Corporation, 113 Eleventh Street, Brooklyn, N. Y., has purchased the business and patent rights of the Messer Mfg. Co., Philadelphia. The combined business will be conducted at the Brooklyn address.

ESTABLISHED 1855

# THE IRON AGE

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## Co-operation on Export Steel

Something has been said in the British iron and steel press of the possibility of joint action by American and British producers of steel in connection with international trade. In *THE IRON AGE* of March 13 an article from the London *Iron and Coal Trades Review* was printed in which it was said that an invitation had been sent by British steel makers to leaders in the industry in the United States to meet in Great Britain and discuss a plan by which manufacturers in both countries would secure a fair profit from their export trade. The same journal recently noted that British steel makers met in London last month a representative of the American steel export trade to discuss the possibility of some arrangement.

The last formal discussion of co-operation between steel manufacturers in the different countries took place in Brussels in early July of 1911. Judge Gary, who presided at that meeting, was empowered to appoint a committee to consider the question. The committee was named and the chairman was authorized to call the members together, but no meeting was ever held. There is little in what has been published thus far to indicate what is now in the minds of the British steel manufacturers, but some of them have been quoted publicly as apprehensive of the possibility of American competition in steel now that British steel makers' costs have reached such high figures, coke, for example, bringing \$9 in Great Britain against \$3.50 in the United States.

The one conspicuous international agreement in years past was that on rails. Its working-out was not satisfactory to British rail makers, their constant complaint being that their export trade had declined under the arrangement.

American steel manufacturers have already availed themselves of the Webb bill provision to organize an export company including the leading independent producers of steel. The object of the Webb bill was to enable American manufacturers to present a solid front in the export trade and to safeguard their profits in that trade against some of the methods used by manufacturers abroad. A conspicuous example commonly cited was the combination of German manufacturers in their purchase of copper. By agreeing at times to stay out

of the market, these manufacturers have been able to depress the price of American copper and by pooling their purchases have had a sufficiently attractive tonnage to offer to tempt concessions from the weaker sellers.

While no official opinion has been given to the effect that the sanctions of the Webb act extend to agreements including both American and foreign manufacturers in a given industry, co-operation in the manner proposed by the British steel makers seems to be in line with the general purpose of the act, namely, the furtherance of American interests in international trade. The export trade in steel from the United States and Great Britain has always had to meet the competition of German cartels, aided by the German practice of well-maintained prices in domestic trade and of cut prices to overcome competition in foreign markets. The working out of the German system and of the competition it met from the United States and Great Britain has made it possible for years for consumers of steel in non-producing countries to buy at lower prices than were paid by consumers of steel in countries which nature had prodigally endowed with coal and iron ore. While "dumping" has been defended on the ground that the sale of a certain tonnage in foreign markets at low prices was often necessary as an aid to full operation of domestic plants, such a defense has never been an adequate answer to the claim of the domestic buyer—whether American, British or German—that he should pay a lower rather than a higher price, in view of his proximity to iron and coal mines and modern blast furnaces and steel works.

We know nothing in detail of the proposals of the British steel makers who now suggest that American and British steel companies should not engage in destructive competition in international markets. It may be assumed, however, that with German competition for the time being eliminated, they see the wisdom of some arrangement by which non-producing countries will pay at least as much for their steel as buyers in Great Britain and the United States. Further, in both countries the burdens of war taxation and of high labor costs create new problems, making it more imperative than ever that export trade stand on all fours with domestic trade in its proportionate contribution to the profits of operation. As time goes on Germany will gain

in ability to compete for export business, but the destruction of "the Imperial Government" takes from the German cartels the main prop of their system of high domestic and low export prices which made them so formidable in competition throughout the world.

### Progress in Non-Ferrous Metals

Advances made in non-ferrous metallurgy in the last few years have been highly important. This is true not only in the United States but particularly in Great Britain, and the war has been a potent stimulus to this development. Not so much has been said about results in this country, but considerable has been published in Great Britain regarding achievements there.

A feature of the British advance has been the production of light alloys for use in aircraft and engines, particularly cast and wrought aluminum alloys. Not only has new information been obtained regarding some of the common alloys of this class, but other alloys have been brought out which show unusual resistance to stresses, combined with the desired lightness. They have marked tensile strength at ordinary and high temperatures, and the record of their casting properties, conductivity, coefficient of expansion, and impact, hardness and stress values contains striking results.

Attention is being directed to the way in which aluminum and its alloys are challenging the position of copper and copper alloys—a development which may have far-reaching results. Already it has opened up a wide field of work. The addition of zinc, nickel, tin, lead and antimony to copper or aluminum makes possible many combinations, and the extent and importance of their applications are at once evident. New compounds, some having remarkable properties, have been supplied to manufacturers in various lines, particularly builders of British airplanes.

On the important matter of melting furnaces much work has been done. In England marked progress has been made with gas-fired furnaces, but the impression prevails that the old type of coke-fired furnace is likely to persist for some time. There is good opinion also for the view that while in England at least the electric furnace as a non-ferrous melting unit is largely in the experimental stage, it will be extensively employed in the future. Progress in the United States in this direction has been rapid lately, and several new types have been developed, with indications that the electric furnace will take as important a place in the non-ferrous industry as it now occupies in steel.

No little attention has been given to the discovery in England of a remedy for the corrosion of marine condenser tubes of brass by salt water—a trouble that has puzzled metal manufacturers and marine engineers for a generation. The results are to be made public soon. There have been rapid strides also in die-casting, parts having been made in England up to four pounds in weight by this process. The production of small non-ferrous parts as stampings from hot metal out of brass swarf is another war contribution, one English firm having delivered millions of such stampings to plants producing war essentials.

Mention should be made of the production in the United States of combinations of non-ferrous metals with rarer metals such as titanium and zirconium. One company has made a successful resistance alloy using titanium and another an acid-resisting alloy containing zirconium. Here also the possibilities are full of promise.

In many cases the details of results have not been made public except possibly as confidential reports exchanged between American and British manufacturers or between investigators representing the two governments. It is to be expected, however, that when these data from both sides of the Atlantic become generally available the war-time advance in the non-ferrous industry will appear to have been more notable than the war's contribution to the metallurgy of steel.

### Some Cost Reductions

Some headway is being made in reducing manufacturing costs. If owners of metal-working shops were to compare notes it would be found that in many cases the cost of manufacture has already been brought appreciably below the war-time basis. Elimination of over-time was one of the first steps taken. The saving on that account dates from the armistice and therefore has been running for half a year. Soon after the armistice, testimony began coming in from iron and steel works and from metal-working establishments to the increased output of workers. As the number of employees diminished with the falling off of war work, those who were still employed did more in a day, appreciating that the amount of work done would be the basis on which they would hold their places. Much more is now heard of this factor in production. From various sources come reports of considerably increased output per man. To what extent this increased output will contribute to the downward revision of prices it is difficult to determine, but it is inevitable that reduced cost of production will mean lower market prices for the product.

In this connection another factor of which more will be heard is the increasing introduction of automatic machinery. Such increase has always come with high labor cost; and as wages generally are at the highest point ever recorded, the efforts to reduce unit labor cost will be redoubled. Manufacturers of metal-working machinery of various descriptions have found orders for automatic machinery a very serviceable stop-gap in the recent weeks of shrunken demand for ordinary tools.

### Active Business a Certainty

A corollary to the old adage that "it takes two to make a bargain" is ignored in some of the philosophizing now indulged in as to the future of business. That corollary is, in essence, that when a transaction occurs there are two parties equally active in it. The corollary was lost sight of by those who ventured to assert, early in the war, that there would be industrial depression afterwards because the various governments would be so saddled with debts, having so much interest, and eventually principal, to pay. What was lost sight of was that

while the governments would have to raise large sums of money annually in taxes, they would also disburse those funds. While the people would have to pay taxes, the people would also receive interest payments as well as principal payments. In substance, the influence would be that of forcing money to circulate more freely.

By the same token the argument that high prices for commodities will operate to prevent buyers from making purchases loses sight of the fact that if a price is high, but is paid nevertheless, the seller is correspondingly benefited and is correspondingly free in making purchases. When there is plenty of money and plenty of work to be done, buyer and seller will not consume much time in coming to terms, and when the bargain is struck both parties will be transacting business. The higher the price the freer the seller will be to spend the money received.

Already it is proved that business can be done, for the fact is that business is being done. The labor surplus at the present time is much less than was predicted in any quarter would obtain at this time, particularly when the major portion of the testimony of employers is that men are working harder, at least per hour, than formerly.

It is quite true that with the purchasing power of the dollar greatly reduced there are certain objections to the making of long term investments that involve new construction. The prospective investor may be unable to compute a proper annual income on the investment, when made at high cost, together with the return of the principal within a suitable time, or he may be able to do both, yet compute at the same time that he would obtain a greater return for a time, a year or two years, by deferring his investment and saving something on the cost of construction. It does not necessarily follow that the subtraction of this quantity of activity from a supposititious whole will leave an actual gap so that the sum total of activity will be less than necessary to keep the country busy as a whole. To assume this would be to assume that the sum total of all possible activities would be no larger job than the country could handle. Measuring the matter in terms of labor, for instance, it would be to assume that the total of all possible jobs would only be sufficient to give each man a job, so that if any group of activities were omitted there would be a corresponding group of men without jobs. To make any such assumption would of course be altogether absurd, when no one has been in position to know just what work was laid out for the country.

What is affected by this matter of costs, or prices, comparing one class of work or material with another, or comparing present levels with those expected to prevail in future, is not business activity as a whole, but the distribution of activity. There are purchases that one will make now irrespective of what price is expected to rule one year or two years hence, and other purchases that one will not make now. One must buy food for the day's needs, irrespective of prospective prices the day following, and clothing for this season's needs irrespective of prices expected to rule in the next season. Uncertainties as to the trend of the general price level will alter the distribution of purchases more than it will the total volume. Money is at hand, and will be

spent in one way or another. The operation of this principle will, of course, be more to the advantage of sellers of food, clothing and articles of that general class than to the advantage of those who sell strictly construction materials.

## Steel Capacity and Demand

When the steel industry is not fully employed, it usually finds it difficult to believe that it will soon become fully employed, while the majority of its customers have no difficulty in concluding that it will be a long time before full employment is attained. Experience is available as a guide, but there is a disposition to doubt whether what has occurred will occur again. Particularly it will be recalled that after the collapse of demand in 1907 it was held in nearly all quarters that several years would elapse before demand grew up to capacity. There was only a small quantity of uncompleted steel mill construction at the time, but the disposition was to regard the pace of demand in 1905-6-7 as exceptional, something that could not be repeated until the country had grown a great deal. Two years later, however, the industry was operating at capacity, having recovered from the worst setback in its whole history.

The waves of demand have come in such manner that comparisons at seven year intervals can be made conveniently. There was full demand in 1899, furnishing practical test of capacity, while seven years later 1906 presented the spectacle of absolutely full employment. Another seven years would carry the comparison to 1913. That was not a year of full demand, but in 1912-13 there was a period of full employment. The production of steel ingots, in gross tons, was as follows in the years mentioned:

1899 .....	10,458,745
1906 .....	22,624,431
1913 .....	30,280,130

The increases shown by these figures are 116 per cent from 1899 to 1906, then 34 per cent from 1906 to 1913. As production in 1899 and 1906 represented capacity, an estimate of capacity in 1913 should be made. The Steel Corporation's successive annual reports have contained a statement of the corporation's output relative to its capacity, and these statements have always confirmed the trade's general appraisal of conditions, while in normal years the corporation has operated at substantially the same ratio of capacity as has obtained with the independents. For 1913 the Steel Corporation stated that it operated at 88 per cent of capacity, and applying this factor to the total ingot production of 1913, the average capacity of the whole industry for the year appears to have been about 34,400,000 tons. This was 52 per cent more than the 1906 production, the 1906 production having been 116 per cent above the 1899 production.

Capacity at present is about 49,000,000 tons, which is only 42 per cent more than 34,400,000 tons. Inasmuch as there is no new construction to speak of in progress, it seems perfectly safe to take 50,000,000 tons for 1920, which carries out the principle of the seven-year interval by being seven years later than 1913, and this 50,000,000 tons would be 45 per cent more than the 34,400,000 ton capacity

of 1913. Thus the successive increments in seven-year intervals would be 116 per cent, 52 per cent and 45 per cent respectively. The figures indicate that the task of providing full employment for the steel industry at this time is relatively a light one.

From the economic viewpoint, of course, there are grave objections to what has occurred. It would be much better if production were at capacity all the time, so that the requisite supply of steel could be furnished with less employment of capital. Between 1906 and 1916 there was no calendar year in which steel capacity was fully employed throughout. Each of the nine intervening years had in this respect one defect or another.

Considering as one group all the other steel producing countries of the world, the disablement of plant facilities during the war has been such that there has not been the normal increase in capacity. It is even doubtful if in 1920 these countries will be able to produce as much steel collectively as they produced in 1913. Should Russia come back, and should the most strenuous efforts be made to rehabilitate the injured and dismantled works of France and Belgium, a slight increase might be shown; but if those things were done it would mean such favorable financial and industrial conditions throughout the world that no one would need to give a passing thought to the question whether there would be full demand in the United States.

### French Steel Prices

The French steel market is on such a false or artificial basis that the situation is described as uncertain by *L'Usine* of April 10. Rolled products are maintained at prices varying between 70 and 80 fr. per 100 kg. for immediate delivery (5.25c. to 6c. per pound at the exchange rate of May 6) in the face of a published price of 60 fr. (4.5c.) which can be obtained only from the largest steel mills and for indefinite delivery. In wire products a recent reduction has been generally confirmed, several works, and not the largest, having indicated a desire to retain contact with the market. Nails are sold at 120 to 150 fr. for No. 20 (\$9 to \$11.25 per 100 pounds). A slight reduction of certain foundry products, particularly those used in building construction, has been made, soil pipe having been offered at about \$7.50 per ton below the price quoted in the beginning of March; heating apparatus and stoves are without price change because of the enormous demand from the devastated country which promises to absorb more than the actual production of this year.

In sheets the difference between the price of the imported English product and that of the French make is emphasized; black sheets are obtainable at a price of about 5.5c. to 5.75c. at a French port, duty paid, while French mills name a price of 9.75c. base. This fact is referred to as throwing light on questions of freedom in importation. In small lots a price of 7.5c. is quoted on sheets from English or American sources.

For nails a large mill in the Paris region has named by circular a base price of 125 fr. per 100 kilos (\$9.35 per 100 lb.). It appears that this price grows out of a desire to place production following a drop in demand for wire products for government engineering work. Compared with this price are to be noted American nails quoted at 175 fr. (\$13 per 100 lb.) for stock replacement purposes; but for large inquiries for delivery directly by importers the price is said to be approximately the same as that of French nails.

Shapes are obtainable at easy delivery terms at a

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price of 70 to 80 fr. (5.25c. to 6c. per pound). It appears that there are large stocks to be moved.

Prices on tin plate fixed by edict Nov. 3, 1918, for a four months' period beginning Dec. 1, are still on that level. For example, a half-box containing 56 sheets 1/2-mm. in thickness weighing 85 kg. for 510 x 710 mm. plates is quoted at 111 fr.; this is a box of 20 x 28-in. tin plate weighing 187 lb. and the price is equivalent to \$18. A full sized box of 112 sheets weighing 198 lb. is quoted at \$25 at the present rate of exchange.

John Stevenson, Jr., Sharon, Pa., has acquired a controlling interest in the capital stock of the Standard Car Construction Co., whose plant is located at Masury, Pa. Mr. Stevenson has purchased the holdings of Bioren & Co., bankers and brokers of Philadelphia, and the holdings of other Philadelphia stockholders. The Standard Car Construction Co. is capitalized at \$1,400,000, and the original plant was built three years ago. Since then it has been substantially enlarged. When working at capacity it employs 700 men and has a daily production of 20 tank cars.

## PIG-IRON OUTPUT REDUCED

### A Net Loss of 54 Stacks in April

Production Last Month 2,478,218 Gross Tons, a Loss of 17 Per Cent from March Rate—  
Six Furnaces Making Ferroalloys

Pig-iron production for the month of April amounted to 2,478,218 gross tons, or an average of 82,607 tons a day, as compared with 3,090,243 tons or 99,685 tons daily in March, a falling off of 17 per cent and 25 per cent from April, 1918. The 212 furnaces active May 1 have an estimated daily capacity of 75,860 gross tons as compared with 266 furnaces rated at 93,165 tons on April 1 and 350 tons rated at 109,675 tons on Jan. 1. During April 56 furnaces, including 13 in the Pittsburgh district, were blown out; 2 were blown in. Reports show a net loss of 54 active stacks in April and 138 in the first four months of this year. Only 17,308 gross tons of ferroalloys were made, spiegeleisen amounting to but 2778 gross tons.

#### Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for April and the three months preceding:

Pig-Iron Production by Districts—Gross Tons				
	Apr. (30 days)	Mar. (31 days)	Feb. (28 days)	Jan. (31 days)
New York .....	166,169	194,375	181,998	217,762
New Jersey .....	9,372	23,437	16,326	18,038
Lehigh Valley .....	72,155	90,086	74,970	93,948
Schuylkill Valley .....	54,755	81,683	85,644	95,234
Lower Susquehanna and Lebanon Valleys .....	39,334	49,743	48,724	55,221
Pittsburgh district .....	531,517	661,307	593,453	668,156
Shenango Valley .....	113,765	144,918	133,825	147,011
Western Pennsylvania .....	114,248	140,364	139,371	179,271
Maryland, Virginia and Kentucky .....	55,957	78,748	80,372	85,043
Wheeling district .....	82,641	115,104	120,908	141,066
Mahoning Valley .....	221,918	285,944	299,464	327,690
Central and Northern Ohio .....	268,784	319,768	286,015	311,322
Southern Ohio .....	51,998	48,820	46,015	65,274
Chicago district .....	416,009	532,511	510,763	564,494
Mich., Minn., Mo., Wis., Col. and Wash. ....	112,811	117,682	112,971	124,494
Alabama .....	149,708	182,845	185,570	181,313
Tennessee .....	17,077	22,908	23,779	26,923
Total .....	2,478,218	3,090,243	2,940,168	3,302,260

#### Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from April, 1918, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons			
	Steel Works	Merchant	Total
April, 1918 .....	79,199	30,408	109,607
May .....	81,238	29,937	111,175
June .....	81,734	29,059	110,793
July .....	79,248	31,166	110,354
August .....	80,947	28,394	109,341
September .....	83,579	30,363	113,942
October .....	83,686	28,796	112,482
November .....	83,395	28,407	111,802
December .....	81,445	29,317	110,762
January, 1919 .....	78,388	28,137	106,525
February .....	78,910	26,096	105,006
March .....	73,468	26,217	99,685
April .....	61,289	21,318	82,607

The figures for daily average production, beginning with January, 1913, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1913—Gross Tons						
	1913	1914	1915	1916	1917	1918
Jan. ....	90,172	60,808	51,659	102,746	101,643	77,799
Feb. ....	92,369	67,453	59,813	106,456	94,473	82,835
Mar. ....	89,147	75,738	66,575	107,667	104,882	103,648
Apr. ....	91,759	75,665	70,550	107,592	111,165	109,607
May ....	91,039	67,506	73,015	108,422	110,238	111,175
June ....	87,619	63,916	79,361	107,053	109,002	110,793
July ....	82,601	63,150	82,691	104,017	107,820	110,354
Aug. ....	82,057	64,363	89,666	103,346	104,772	109,341
Sept. ....	83,531	62,753	95,085	106,745	104,465	113,942
Oct. ....	82,133	57,361	100,822	113,189	106,550	112,482
Nov. ....	74,453	50,611	101,244	110,394	106,859	111,802
Dec. ....	63,987	48,896	103,333	102,537	92,997	110,762

The furnaces blown out include Harriet Y and Nos. 3 and 6 Lackawanna in the Buffalo district; No. 3 Wharton in New Jersey; Crumwold and Macungie in the Lehigh Valley; Keystone and Topton in the Schuylkill Valley; No. 3 Clairton, No. 5 Duquesne, D and K

stacks of Edgar Thomson, Edith, No. 3 Isabella, No. 1 Lucy, Neville Island, two Eliza, Soho and No. 1 Monessen in the Pittsburgh district; Ella, Newcastle Nos. 1 and 2, Sharon, Sharpsville and No. 3 Shenango in the Shenango Valley; one Johnstown and No. 1 Josephine in western Pennsylvania; Goshen and Princess in Virginia; Bethlehem stack D in Maryland; No. 2 Ashland and one Grand Rivers in Kentucky; No. 1 Mingo in the Wheeling district; Niles, No. 3 Ohio and Mattie in the Mahoning Valley; Franklin, Dover, one National Tube, and Nos. 1 and 3 River in northern Ohio; Nos. 2 and 5 South Chicago, and No. 4 Iroquois in Illinois; Nos. 5 and 9 Gary and one Madeline in Indiana; stack A of Detroit Iron & Steel Co.; No. 2 Pioneer, No. 4 Bessemer and Oxmoor in Alabama; one Allen's Creek and Rockdale in Tennessee.

The furnaces blown in were Hamilton in southwest Ohio and No. 5 Ensley in Alabama.

#### Capacity in Blast May 1

The following table shows the number of furnaces in blast May 1 in the different districts and their capacity, also the number and daily capacity in gross tons of furnaces in blast April 1:

Coke and Anthracite Furnaces in Blast				
Location of furnaces	Total Number of stacks	May 1 Number in blast	May 1 Capacity per day	April 1 Number in blast
New York:				
Buffalo .....	21	12	4,610	14
Ferro .....	1	0	0	1
Other N. Y. ....	4	2	485	2
New Jersey .....	5	2	310	3
Pennsylvania:				
Lehigh Valley ..	18	12	2,115	13
Spiegel .....	2	1	95	1
Schuylkill Valley ..	16	5	1,810	7
Lower Susquehanna ..	11	2	875	2
Lebanon Valley ..	6	2	365	2
Ferro and Spiegel ....	4	1	65	1
Pittsburgh District ..	52	32	15,440	44
Ferro and Spiegel ....	5	2	270	3
Shenango Valley ..	19	8	2,880	14
Western Pennsylvania ..	28	13	3,575	14
Maryland .....	4	1	360	2
Wheeling District ..	14	7	2,560	8
Ohio:				
Mahoning Valley ..	27	15	7,110	18
Central and Northern ..	26	19	8,390	24
Southern .....	17	12	1,730	11
Illinois and Ind. ....	40	25	12,900	32
Ferro .....	1	1	130	1
Mich., Minn., Mo. and Wash. ....	13	8	2,260	9
Col., Mo. and Wash. ....	8	4	1,200	4
The South:				
Virginia .....	15	8	1,085	9
Ferro .....	7	0	0	1
Kentucky .....	45	14	4,580	16
Alabama .....	17	5	530	7
Tennessee .....				
Total .....	430	212	75,860	266

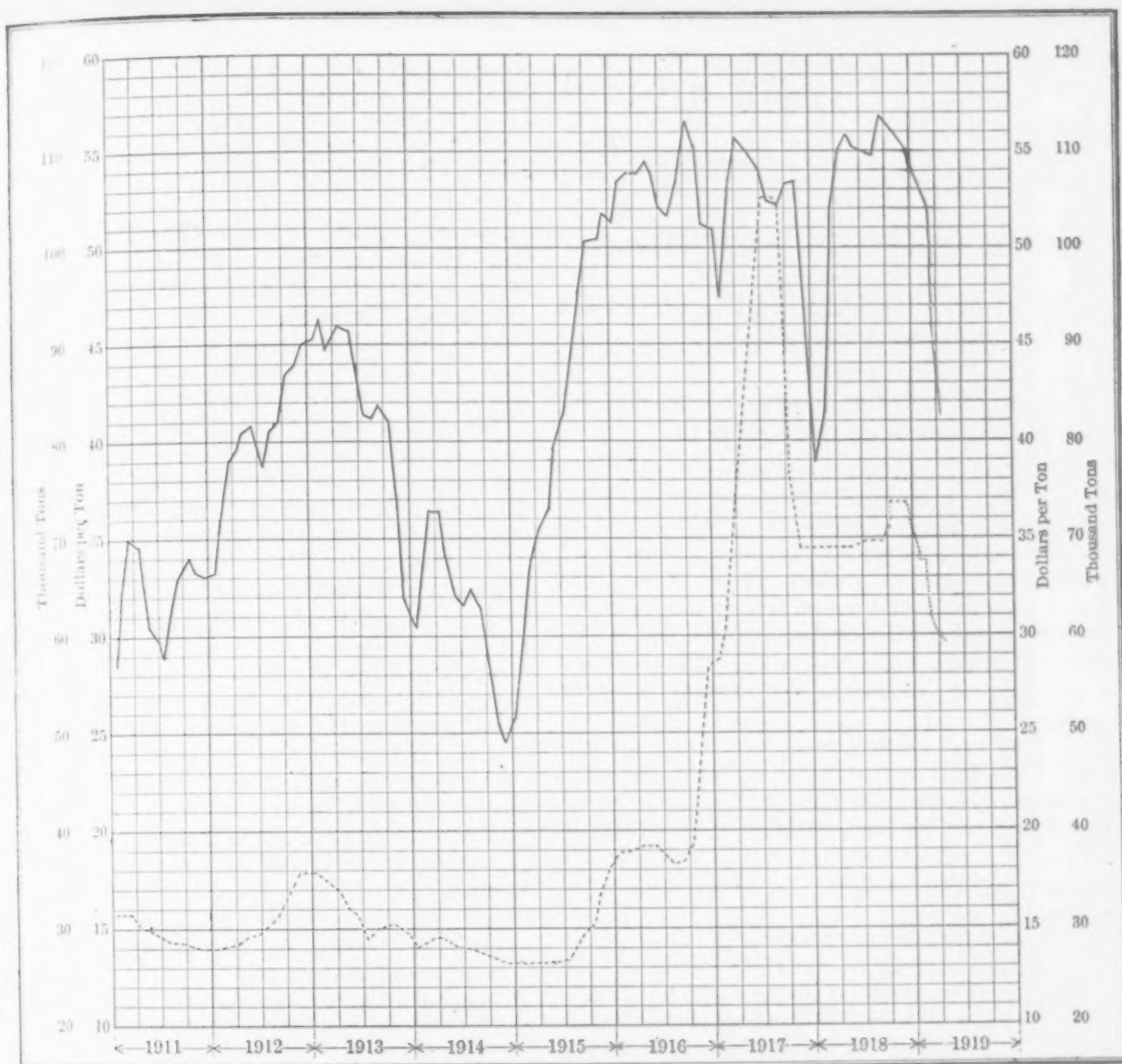
#### Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steelmaking iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons				
	Total Production			Spiegeleisen and Ferromanganese
	1917	1918	1919	1917 1918 1919
Jan. ....	2,244,203	1,756,208	2,430,022	38,792 30,695 32,787
Feb. ....	1,829,846	1,620,254	2,209,470	32,137 26,114 28,105
Mar. ....	2,285,430	2,349,419	2,277,507	36,563 39,122 26,444
Apr. ....	2,370,937	2,411,488	1,838,677	39,595 35,511 17,308
May ....	2,404,380	2,513,577	.....	37,701 54,633 .....
June ....	2,304,155	2,407,166	.....	30,829 44,844 .....
July ....	2,369,630	2,456,693	.....	43,884 51,762 .....
Aug. ....	2,214,513	2,509,357	.....	39,492 54,009 .....
Sept. ....	2,198,705	2,507,381	.....	42,235 66,275 .....
Oct. ....	2,376,589	2,594,277	.....	48,691 70,379 .....
Nov. ....	2,349,545	2,501,867	.....	34,688 59,638 .....
Dec. ....	2,094,659	2,524,794	.....	29,902 49,435 .....

#### Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from 1910 to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production by months of coke and anthra-



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

cite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnace at Chicago, and No. 2 X at Philadelphia. They are based on the weekly market quotation of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1915—Gross Tons

	1915	1916	1917	1918	1919
Jan.	1,601,421	3,185,121	3,150,938	2,411,768	3,302,260
Feb.	1,674,771	3,087,212	2,645,247	2,319,299	2,940,168
Mar.	2,063,834	3,337,691	3,251,352	3,213,091	3,090,243
Apr.	2,116,494	3,227,768	3,334,960	3,288,211	2,478,218
4 mos.	7,456,520	12,837,792	12,382,497	11,232,369	11,810,889
May	2,263,470	3,361,073	3,417,340	3,446,412	.....
June	2,380,827	3,211,588	3,270,055	3,323,791	.....
July	2,563,420	3,224,513	3,342,438	3,420,988	.....
Aug.	2,779,647	3,203,713	3,247,947	3,389,585	.....
Sept.	2,852,561	3,202,366	3,133,954	3,418,270	.....
Oct.	2,125,491	3,508,849	3,303,038	3,486,941	.....
Nov.	2,037,308	3,311,811	3,205,794	3,354,074	.....
Dec.	2,203,322	3,178,651	2,882,918	3,433,617	.....
Total	29,662,566	39,039,356	38,185,981	38,506,249	.....

\*These totals do not include charcoal pig iron. The 1918 production of this iron was 347,224 tons.

### Owners Take Port Henry Furnace

Witherbee, Sherman & Co. have taken over their blast furnace at Port Henry, N. Y., which for the past 20 years has been operated under lease by the Northern Iron Co., an identified interest of Pilling & Crane, Philadelphia. The furnace is now out of blast for relining and general repairs, but with no time set for blowing in. A second turbine steam blowing engine will be installed.

Eventually the furnace will be equipped with a skip hoist, but there are no immediate plans for this improvement. The furnace has been operated for the most part in the period of the lease in the production of low phosphorus pig iron. This is also the product of Standish furnace, which the Northern Iron Co. still operates under lease.

A suit to recover money and notes aggregating \$300,000 was filed last week in United States District Court against John W. Hubbard by the Shenandoah Valley Manganese Corporation of Virginia. The suit involves the sale of the West End blast furnace, Roanoke, Va., by Hubbard to the plaintiff company Oct. 23, 1918. According to the bill filed, Hubbard agreed to sell the furnace and the company paid \$10,000. Later, a voucher for \$90,000 and four negotiable notes for \$50,000 each were given Hubbard, the bill avers. The furnace was to have been turned over to the corporation Jan. 1, 1919, but Hubbard failed to deliver it, the bill alleges. A preliminary injunction in favor of the plaintiff is asked, enjoining Hubbard from negotiating or transferring the notes. The petition also asks that Hubbard be directed to surrender the voucher and the \$10,000, with interest from Oct. 23, 1919.

Six hundred of the 2400 employees of the Carpenter Steel Co. plant at Reading, Pa., were discharged by officials for not coming to work on May Day, May 1, after having been warned that every man would be expected to be on duty.

# Iron and Steel Markets

## CONFERENCE PENDING

### Railroad Administration to Discuss Prices with Steel Producers

#### Pig Iron Output Cut Down Sharply—Better Outlook for Steel Exports

The steel trade is taking only a mild interest in the meeting of Railroad Administration representatives with the steel makers' committee in New York Thursday. That a \$2 concession on rails would meet the situation is a persistent report, but such a reduction has been once refused by the rail mills, with an accompanying exhibit of costs, and to-day, with output still falling, overhead, as the producers may show on Thursday, has brought costs up higher.

If this week's meeting can only bring the cutting of the knot and leave the industry free from deadly Government paltering, there are signs that betterment will be seen. Whatever its results in the way of railroad buying, the interview is not expected to influence greatly, if at all, the general price level.

The fact that the steel market is so sharply at variance with mercantile conditions throughout the country, coupled with the steady depletion of ultimate stocks in all forms, is bringing out reminders of other periods in which contraction was overdone.

Pig-iron statistics for April show that that industry is rapidly adjusting itself to the shrinkage in iron consumption. No less than 54 furnaces blew out last month, leaving 212 active as May came in, against 372 on Sept. 1 last year when the peak was reached. In April the output was 2,478,218 gross tons, or 82,607 tons a day, against 3,090,243 tons for the 31 days of March or 99,685 tons a day.

Capacity active May 1 was 75,860 tons a day for 212 furnaces, against 93,165 tons a day for the 266 furnaces in blast on April 1. Production at the opening of this month, estimating charcoal iron, was at the rate of 28,000,000 tons a year. This compares with an actual output of 39,052,000 tons in 1918. Not since May, 1915, when there were the first signs of a war demand for American steel, has pig-iron production been at so low a rate as to-day's.

Persistent rumors of price concessions on Alabama pig iron point to the possibility of movements of resale iron. In all lines the absence of price-cutting in the old-time sense is remarked, considering the low scale of mill operations. Some resale iron ore has been offered, some of it at as much as \$1 per ton below the market, but there is probably not more than 200,000 tons of such ore available.

The Chicago district furnishes several items of encouragement in the export trade—an order for 4700 tons of structural shapes for Japan, one for 4000 tons of plates for Canada and the rein-

statement of 2100 cars ordered for France months ago. By July 1, when more vessel room is definitely assured, the export movement is expected to pick up considerably.

The Navy Department has placed with the Carnegie Steel Co. orders for 9200 tons of special treatment protective deck plates and 5000 tons of nickel-steel plates. About 20,000 tons of carbon-steel plates, on which bids were taken at the same time, are being held up pending the Thursday meeting, as are also 25,000 tons of plates, shapes and bars, bids for which closed April 4.

Contracting for fabricated steel covering many small projects adds a sizeable total to the going business. Steel plant extensions, conspicuous for their rarity, include 2300 tons for the Trumbull Steel Co. and the Mansfield Sheet & Tin Plate Co.

As if to emphasize the blight which governmental intervention has brought over the market, the Railroad Administration admits that its recent inquiry for spikes was merely a feeler and repeats its advertisement for 6000 tons of plates for railroad barges. The heavy reductions in bolts and nuts in March have not stimulated any demand.

Bright spots stand out in the wire and sheet trades. New orders for wire in April amounted in the case of several mills to 70 to 80 per cent of capacity. A demand for electrical sheets is developing and the increased consumption of automobile sheets has filled mills for 60 days.

## Pittsburgh

PITTSBURGH, May 6—(By Wire).

Much interest is shown in the outcome of the meeting to be held in New York on Thursday at which the Railroad Administration will be represented and also the committee of steel manufacturers appointed some time ago by Judge Gary, the latter, it is understood, agreeing to attend the meeting after a good deal of persuasion. The trade here does not believe that much good can come out of this meeting unless Director-General Hines should agree to accept the prices on rails fixed at the meeting at Washington, on March 20. Some in the trade here have suggested that possibly another reduction in prices of rails might clarify the situation, but on the other hand it is argued that any further reductions in rails would also mean lower prices on other steel products. The general opinion is held here that chances favor an open steel market.

In the meantime, the steel business remains at a halt; orders being placed still represent only actual needs of jobbers and consumers, and are largely for prompt shipment, showing that the material is badly needed. There is no disposition to anticipate needs under present conditions, nor have the mills been insistent that contracts be placed while the present uncertain condition lasts. There seems to be a steady decrease in the volume of business, in spite of the fact that demand for sheets is a little better, and lap-weld pipe and oil country goods have been active in demand for some time. Large steel concerns, such as the Carnegie Steel Co., are cleaning up Government orders pretty fast, and as a result are slowing down in operations. At this writing, the Carnegie company has in blast only 28 out of its 59 blast furnaces, the num-

# A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

	May 6, 1919	Apr. 29, 1919	Apr. 8, 1919	May 7, 1918
<b>Pig Iron, Per Gross Ton:</b>				
No. 2 X, Philadelphia...	\$31.90	\$31.90	\$31.90	\$34.25
No. 2 Valley furnace...	26.75	26.75	26.75	33.00
No. 2 Southern, Cincinnati...	30.35	30.35	30.35	35.90
No. 2 Birmingham, Ala. f...	26.75	26.75	26.75	33.00
No. 2 Birmingham, Chicago*	26.75	26.75	26.75	33.00
No. 2 furnace, eastern Pa...	29.65	29.65	29.65	32.75
Bessemer, Valley furnace...	25.75	25.75	25.75	32.00
Bessemer, Pittsburgh...	29.35	29.35	29.35	36.15
Malleable, Chicago*	27.25	27.25	27.25	33.50
Malleable, Valley...	27.25	27.25	27.25	33.50
Gray forge, Pittsburgh...	27.15	27.15	27.15	32.75
L. S. charcoal, Chicago...	38.85	38.85	38.85	37.50

## Rails, Billets, Etc.,

<b>Per Gross Ton:</b>				
Bessemer rails, heavy, at mill...	45.00	45.00	45.00	55.00
O-h rails, heavy, at mill...	47.00	47.00	47.00	57.00
Bessemer billets, Pittsburgh...	38.50	38.50	38.50	47.50
O-h billets, Pittsburgh...	38.50	38.50	38.50	47.50
O-h sheet bars, P'gh...	42.00	42.00	42.00	51.00
Forging billets, base, P'gh...	51.00	51.00	51.00	60.00
O-h billets, Phila...	42.50	42.50	42.50	50.50
Wire rods, Pittsburgh...	52.00	52.00	52.00	57.00

## Finished Iron and Steel,

<b>Per Lb. to Large Buyers:</b>	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.595	2.595	2.595	3.685
Iron bars, Pittsburgh...	2.35	2.35	2.35	3.50
Iron bars, Chicago...	2.50	2.50	2.50	3.50
Steel bars, Pittsburgh...	2.35	2.35	2.35	2.90
Steel bars, New York...	2.62	2.62	2.62	3.095
Tank plates, Pittsburgh...	2.65	2.65	2.65	3.25
Tank plates, New York...	2.92	2.92	2.92	3.445
Beams, etc., Pittsburgh...	2.45	2.45	2.45	3.00
Beams, etc., New York...	2.72	2.72	2.72	3.195
Skelp, grooved steel, P'gh...	2.45	2.45	2.45	2.90
Skelp, sheared steel, P'gh...	2.65	2.65	2.65	3.25
Steel hoops, Pittsburgh...	3.05	3.05	3.05	3.50

\*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

<b>Sheets, Nails and Wire,</b>	May 6, 1919	Apr. 29, 1919	Apr. 8, 1919	May 7, 1918
<b>Per Lb. to Large Buyers:</b>	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh...	4.35	4.35	4.35	5.00
Sheets, galv., No. 28, P'gh...	5.70	5.70	5.70	6.25
Wire nails, Pittsburgh...	3.25	3.25	3.25	3.50
Cut nails, Pittsburgh...	4.25	4.25	4.25	4.00
Fence wire, base, P'gh...	3.00	3.00	3.00	3.25
Barb wire, galv., P'gh...	4.10	4.10	4.10	4.35

## Old Material,

<b>Per Gross Ton:</b>				
Carwheels, Chicago...	\$21.00	\$21.00	\$21.00	\$29.00
Carwheels, Philadelphia...	22.00	22.00	24.00	29.00
Heavy steel scrap, P'gh...	14.50	15.00	15.50	28.50
Heavy steel scrap, Phila...	15.00	15.00	15.50	29.00
Heavy steel scrap, Ch'go...	15.75	15.75	16.50	28.50
No. 1 cast, Pittsburgh...	17.00	18.00	18.00	28.50
No. 1 cast, Philadelphia...	21.50	22.00	22.00	29.00
No. 1 cast, Ch'go, net ton...	20.00	20.00	22.00	27.00
No. 1 RR. wrot., Phila...	21.00	21.00	22.00	34.00
No. 1 RR. wrot., Ch'go, net...	15.50	15.50	16.00	29.75

## Coke, Connellsville,

<b>Per Net Ton at Oven:</b>				
Furnace coke, prompt...	\$3.50	\$3.50	\$3.75	\$6.00
Furnace coke, future...	4.00	4.00	4.25	6.00
Foundry coke, prompt...	4.00	4.00	4.50	7.00
Foundry coke, future...	4.50	4.50	5.00	7.00

## Metals,

<b>Per Lb. to Large Buyers:</b>	Cents	Cents	Cents	Cents
Lake copper, New York...	15.50	15.50	15.62½	23.50
Electrolytic copper, N. Y...	15.25	15.25	15.37½	23.50
Spelter, St. Louis...	5.92½	6.02½	6.30	6.62½
Spelter, New York...	6.27½	6.37½	6.65	7.12½
Lead, St. Louis...	4.85	4.95	5.00	6.42½
Lead, New York...	4.60	4.70	5.25	6.62½
Tin, New York...	72.50	72.50	72.50	\$1.00
Antimony, Asiatic, N. Y...	6.62½	6.62½	6.62½	13.00
Tin plate, 100-lb. box, P'gh...	\$7.00	\$7.00	\$7.00	\$7.75

ber idle being the largest the company has had in some years and, of course, there is a corresponding slowing down of operations in the company's steel works. The steel plants and finishing mills in this district are operating at probably 50 per cent of normal capacity, some concerns doing a little better and others not so well. Orders coming in do not represent more than 25 to 30 per cent of capacity, the remainder being made up of old contracts taken some time ago, some of them last year before the armistice was signed, and on which shipments have not been completed.

Should an open market result as the outcome of the steel meeting on Thursday, it is generally conceded that steel prices will be lower, but not probably to the extent that some in the trade believe.

**Pig Iron.**—There is no inquiry and the output in this and other nearby districts is steadily going down, owing to the blowing out of so many blast furnaces. For the past two or three years, the furnaces have been driven at a very hard rate. Most of them were badly in need of relining and repairs, and the present dullness in the pig iron trade has given an opportunity for doing this work. It is stated that the Carnegie Steel Co. will reline and repair all its blast furnaces that are not in first class condition, and have them in good physical condition when the recovery in demand for pig iron comes. Moreover, it is not regarded as a good time to make iron and pile it at present high costs, and this is another reason why so many furnaces have gone out. Some of the merchant furnaces which cannot produce profitably at present prices have stopped until the market recovers, or else prices of iron advance again to a point that will make operation advisable. Prices on pig iron are largely nominal, and it seems certain that if any large business was offering the listed prices of to-day could be materially shaded. Not enough demand has come out for two or three months to test prices. We do not hear of any sales in the past week and quote as follows:

Basic pig iron, \$25.75; Bessemer, \$27.95; gray forge, \$25.75; No. 2 foundry, \$26.75; No. 3 foundry, \$26.25; and

malleable, \$27.25; all per gross ton at Valley furnaces, the freight rate for delivery in the Cleveland and Pittsburgh districts being \$1.40 per ton.

**Ferroalloys.**—With the slowing down in operations of the steel mills, the consumption of ferroalloys is getting steadily less and there is practically no demand. Offers of resale material are freely made, and this material can be bought at prices very much under those named by the manufacturers. As noted before, resale ferromanganese had been sold at \$110, and there are reports of sales of several cars at a still lower price. If any real business were offering in ferroalloys, there is no doubt that the prices named below would be shaded. These prices are purely nominal.

We quote 78 to 82 per cent resale ferromanganese at \$110 to \$115, delivered, with a reduction of about \$2 per unit for lower percentages. We quote resale 50 per cent ferrosilicon at \$90 to \$95 and resale 18 to 22 per cent spiegeleisen at \$35, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, \$43; 10 per cent, \$45; 11 per cent, \$48; 12 per cent, \$51. We quote 6 per cent silvery iron, \$36.75; 7 per cent, \$37.75; 8 per cent, \$40.25; 9 per cent, \$42.25, and 10 per cent, \$44.75, but some sellers not in Jackson County have been quoting on a basis of \$35 for 6 per cent. About \$3 per gross ton advance is charged for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which have a uniform freight rate of \$2.90 per gross ton for delivery in the Pittsburgh district.

**Billets and Sheet Bars.**—The local steel market is excessively quiet, there being no demand for steel, and many consumers who buy on regular contracts from one or two sources of supply are not taking out more than about 50 per cent of the quantity of billets and sheet bars that they use in normal times. Steel has been offered recently at \$3 per ton less than the prices supposed to be effective from March 21, but no business resulted. There is very little business in finished products, and consumers are not in need of the steel. Hence offers to shade prices are without result. Steel mills in the Pittsburgh, Youngstown, and Wheeling districts are operating to not over 50 per cent of capacity.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at \$38.50, 2 x 2 in. billets at \$42; sheet bars, \$42; slabs, \$41,

and forging billets \$51 base, all f.o.b. at mill, Pittsburgh or Youngstown.

**Plates.**—The Government has requested bids on 6000 tons of steel plates for railroad barges, desiring these bids to be in Washington on Tuesday, May 6, but several mills have asked for an extension of time until they can make up their figures. This is the fourth or fifth time that the Government has asked prices on this particular lot of plates, and the mills hope at this time the order will be placed. Output of plates in April by the Carnegie Steel Co. was less than in March, as this concern has about cleaned up some of its Government orders. No cars are being placed, and there is very little new plate work being done just now, so that the demand for plates is very quiet, and all the mills are badly in need of orders. As a rule plate mills are not working to more than 50 per cent of capacity, and have very little work ahead. There are reports of slight shading in prices by some of the smaller mills. We quote  $\frac{1}{4}$ -in. and heavier sheared plates at 2.65c. at mill, Pittsburgh.

**Structural Material.**—Any work coming out is only for small lots, largely repair jobs, and even these are scarce. The McClintic-Marshall Co. has taken about 300 tons for a new forge shop for the Mesta Machine Co. and 260 tons for an addition to the People's Natural Gas Building on Sixth Avenue in this city. The Massillon Bridge Co. has taken 530 tons for extensions to the plant of the Mansfield Sheet and Tin Plate Co., Mansfield, Ohio. Some local work is projected, among this being four bridges crossing local rivers, but it will probably be some months before this comes to a head, and it is possible none of these bridges will be built until steel and labor are cheaper.

We quote beams and channels up to 15 in. at 2.45c. at mill, Pittsburgh.

**Iron and Steel Bars.**—Mills report the new demand for both iron and steel bars as light, being only for small lots to meet actual needs, and there is some shading in prices. The demand for reinforcing steel bars is also very limited, owing to the dull building conditions, and prices on these are also being shaded \$2 or more per ton.

We quote soft steel bars rolled from billets at 2.35c., from old steel rails, 2.45c. Bar iron is quoted at 2.35c. for Eastern shipment and 2.55c. for Western shipment.

**Sheets.**—Several of the larger mills report the demand for electrical sheets as heavier than at any time since the armistice was signed. When this occurred demand for these sheets almost stopped, and has continued so until recently, but mills now state they are getting fair-sized orders. The demand for highly finished sheets for the automobile builders is very heavy and is getting larger. Some mills that make a specialty of automobile sheets are sold up for the next 60 days. The demand for galvanized sheets is very dull. As a rule, the independent mills are operating to about 60 per cent, while the American Sheet & Tin Plate Co. is doing a little better. It is said regular prices, effective from March 21, are being generally held, being shaded only in isolated cases, and usually by jobbers who desire to move stocks out more freely. Prices on sheets are given in detail on page 1262.

**Tin Plate.**—The tin plate trade is lagging a good deal, but it is believed that by June the demand will be much heavier. Some of the Chicago meat packers carried over very heavy stocks from last year and are still working on these, having bought very little tin plate so far this year. It is said one leading Chicago packer has enough tin plate in stock carried over from last year to meet its entire demands for this year. There is some export inquiry, on which regular domestic prices are being quoted, but the amount of export business being placed is relatively small. Mill operations are still on about a 50 per cent basis. Any shading of prices is usually on stock items, and does not amount to more than from 25 to 50c. per box. We quote tin plate at \$7 per base box f.o.b. Pittsburgh, for delivery to July 1. For prices on terne plate see page 1262.

**Wire Rods.**—There is a fair amount of inquiry, but sales are usually of small lots only for current needs of consumers. Some sales are being made for export, and these are at domestic prices.

**Wire Products.**—On all export inquiries for wire and wire nails, mills are now quoting net prices, and have discontinued allowing the 2 per cent cash discount. It is said this also applies on all other steel items. Several mills report that their new orders for wire in April were between 70 and 80 per cent of capacity, but for wire nails were smaller. Local mills state they are maintaining holding prices, but occasionally miss some business by doing so, this indicating that prices are not firmly held in all cases. It is said that bright nails and also coated nails are being shaded in certain sections from 10c. to 15c. per keg. Prices on wire products are given in detail on page 1262.

**Hot-Rolled Strip Steel.**—The demand continues light, and is only for small lots for prompt shipment. It is said in some cases the agreed price of \$3.30 per 100 lb. is sometimes shaded.

**Cold-Rolled Strip Steel.**—Orders are lagging and are only for small lots for current needs and for prompt shipment. Mills are not operating to more than 40 to 50 per cent.

We quote cold-rolled strip steel at \$5.65 base per 100 lb. f.o.b. Pittsburgh, for  $1\frac{1}{2}$ -in. and wider, 0.100 in. and thicker hard tempered in coils 0.20 carbon and under. Boxing charge 25c. per 100 lb.

**Nuts and Bolts.**—The heavy reductions made last month in prices on nuts and bolts have not stimulated the demand as expected. Makers state that consumers and jobbers are still buying only small lots to cover actual needs, but in nearly all cases request prompt shipment, showing that the material is badly needed and is being used. There is some shading of prices, some makers absorbing the freight, while others make a direct cut in prices. Discounts, which do not represent in all cases bottom prices, are given on page 1262.

**Shafting and Screw Stock.**—Orders and specifications have been better in the past two weeks, but still represent only 40 to 50 per cent of capacity. The automobile trade continues to buy freely, and recently some jobbers placed orders to go into stock. Very few specifications are coming in from the implement manufacturers.

We quote cold-rolled shafting at 28 per cent off list to carloads and 23 per cent in less than carloads, f.o.b. Pittsburgh.

**Iron and Steel Pipe.**—Mills continue to report a very active demand for lap-weld pipe and also for oil country goods, and on the latter some mills report they are sold up for the next 60 days, or longer, and are not promising delivery on new orders before August. The heavy development in the oil fields in Texas, Wyoming, and Louisiana is responsible for the heavy demand for line pipe and nearly every day orders are being placed for large and small lines for prompt shipment. It is said that at the present time there is active inquiry for 500 miles of 2-, 4- and 6-in. pipe for contemplated oil lines, and most of this is likely to be placed at an early date. There are also two or three large inquiries for gas lines, involving heavy quantities of 6-, 8- and 10-in. pipe. Mills say they are comfortably fixed on lap-weld pipe and oil country goods for the next 60 to 90 days. The demand for butt-weld pipe is light owing to the dull building conditions all over the country. There is some shading in prices on both iron and steel pipe, but it is said this is mostly by jobbers who desire to move out stocks more quickly. Discounts on iron and steel pipe are given on page 1262.

**Hoops and Bands.**—The demand is still very light, and only for small lots to cover actual needs. Several hoop and band mills in this district are down entirely for lack of business. Reports are that cutting in prices is being done on the small amount of business being placed. The official price in hoops and bands is 3.05c., usual extras, Pittsburgh.

**Spikes.**—It develops that a recent inquiry from the United States Railroad Administration, through H. B. Spencer, Director, Division of Purchases, for 10,000 to 20,000 kegs of  $5\frac{1}{2}$  x 9/16-in. spikes was only a feeler, and makers have been so advised. It is said all the spike makers quoted the regular price of \$3.35 per 100 lb. on this inquiry, and as a result purchasing agents of the different railroads have been directed to

place orders with the makers direct for whatever spikes they urgently need. The Baltimore & Ohio bought 500 to 600 kegs last week, and the Southern Pacific is in the market for 4000 kegs for prompt shipment.

We quote standard spikes, 9/16 x 4 1/2 in. and also small spikes, \$3.35 base per 100 lb. in carload lots of 200 kegs or more plus usual extras. Boat and barge spikes, \$3.85 per 100 lb. in carload lots of 200 kegs or more.

**Boiler Tubes.**—The demand for locomotive tubes is a little better, but for merchant tubes is very quiet. Mills making iron or steel tubes are not operating better than 50 per cent. It is said prices are being generally held, and are only slightly shaded in exceptional cases. Discounts on tubes, which are not always minimum of the market, are given on page 1262.

**Coke.**—Conditions in the coke trade do not show betterment. The demand for furnace coke is getting steadily less, owing to so many furnaces going out of blast. The coke producers are still endeavoring to limit output to actual demand, and production in the two Connellsville regions is smaller every week, and is now at the lowest point reached for some years. It is stated that prices on coke are probably as low as they will go, and to many of the smaller coke plants are below cost. We quote best grades of blast furnace coke at \$3.50 to \$3.75 for prompt and \$4 to \$4.50 on contracts. Standard 72-hr. foundry coke loaded on cars, and which has to be moved, is offered as low as \$4 to \$4.25, while for future delivery, \$4.50 to \$5 is charged, depending on quality. Output of coke in the Upper and Lower Connellsville regions for the week ended April 26 was only 135,360 tons, a decrease from the previous week of more than 11,000 tons and a falling off as compared with the same week in 1918 of 208,505 tons. It was the lowest output in any one week for more than 10 years.

**Old Material.**—The local scrap market is very much depressed, there being no demand from consumers, while dealers are offering scrap more freely, and are willing to shade prices to make sales. In addition, the United States Government and the British Government are both offering very large quantities of scrap in this market, thus helping to further reduce prices. In the past week all grades of scrap have gone off from \$1 to \$1.50 per ton. Some time ago local scrap dealers were inclined to store scrap in the belief that the market would be better later, but they are now trying to make sales, having large stocks of scrap on hand. The May scrap list of the Pennsylvania Railroad is unusually heavy, and contains over 25,000 tons of various kinds. The Bureau of Iron and Steel Scrap, organized during the war, has been dissolved, but it has not been active for some time. We note sale of about 500 tons of borings at about \$11, and the same quantity of turnings at \$9.75 per gross ton, delivered to buyers' works. We have reduced prices on nearly all grades from \$1 to \$1.50 per gross ton, and now quote for delivery to mills in the Pittsburgh district and other consuming points that take Pittsburgh freights, as follows:

Heavy steel, melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	\$14.50
No. 1 cast, for steel plants	\$17.00 to 17.50
Revolving rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	16.00 to 16.50
Compressed steel	12.50 to 13.00
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district	11.00 to 11.50
Bundled sheet stamping	10.00 to 10.50
No. 1 busheling	13.50 to 14.00
Railroad grate bars	13.00 to 13.50
Low phosphorus melting stock (bloom and billet ends, heavy plates) 3/4 in. and heavier	21.00 to 21.50
Iron car axles	28.00 to 29.00
Locomotive axles, steel	28.00 to 29.00
Steel car axles	25.00 to 26.00
Railroad malleable	14.00 to 15.00
Machine shop turnings	9.50 to 9.75
Cast iron wheels	19.00 to 20.00
Roller steel wheels	17.00 to 18.00
Sheet bar crop ends (at origin)	18.00 to 18.50
Heavy steel axle turnings	12.00 to 13.00
Heavy breakable cast	18.00 to 19.00
Cast iron borings	10.50 to 10.75
No. 1 railroad wrought	19.00

## British Iron and Steel Market

### Domestic Prices Advancing—Tin-Plate Bars Higher—Official Control Ended

(By Cable)

LONDON, ENGLAND, May 2.

Official control of the markets was removed May 1. Demand for pig iron is brisk. Steel makers have fixed the price of tin-plate bars from May 1 at £13 10s., delivered South Wales, an advance of \$5.80 per ton. Marked bars are placed at £23 10s., makers' works, or \$16.38 a ton higher. An advance of £2 15s. per ton (\$12.87) was made on bar iron and strip on orders and contracts made on a fluctuating basis from May 1. The makers of steel hoops decided on an advance of £2 10s. (\$11.70) per ton on undelivered balances and orders already placed and on future business.

All domestic prices are advancing but definite figures are awaited. We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalents figured at \$4.68 for £1:

Pig iron	£	s.	
Cleveland No. 3 foundry	7	0	\$32.76
Tin plate bars	13	10	\$63.18
Rails, 60 lb. and upward	15	0	\$70.20
Steel bars	19	0	\$88.92
Structural material	16	10	\$77.22
Plates	17	0	\$79.56
Bar iron	20	10	\$95.94

### German Pig Iron and Steel Production in 1919

The German Association of Iron and Steel Producers of Germany reports the January production of 499,352 tons of pig iron, 565,780 tons of steel, and 477,149 tons of rolled products. These quantities, according to the *London Iron and Coal Trades Review*, were not entirely available for the inland market, as it is necessary to deduct from them the output in the Allied occupied districts, including the bridgeheads. The quantity diverted in this way comprised 95,255 tons of pig iron, 95,981 tons of steel, and 82,257 tons of rolled manufactures. As a consequence, the quantity remaining for the non-occupied districts was 404,097 tons of pig iron, 469,799 tons of steel, and 394,892 tons of rolled products, as compared with 390,772 tons, 424,189 tons, and 334,528 tons respectively in December, 1918.

The February output, as reported in the British cable to THE IRON AGE, April 24, was 469,000 tons of pig iron and 439,000 tons of steel.

Two of the batteries of 60 ovens each of the Koppers by-product coke plant being built for the Jones & Laughlin Steel Co. at Pittsburgh by the H. Koppers Co. of that city, are now being heated up preparatory to charging coal and the ovens will likely be put in operation early next week. There are five units of 60 ovens each embraced in this plant, but the other 180 ovens will not be ready for some time. On May 6 the Carnegie Steel Co., Pittsburgh, was operating only 28 of its 59 blast furnaces, 31 being the largest number the company has had idle in some years.

The annual convention of the Amalgamated Association of Iron, Steel and Tin Workers convened in Louisville on Monday, May 5. M. F. Tighe is president and Fred Keightly is secretary. It is stated the changes proposed in the puddling, sheet and tin plate mills this year are not very important and it is believed settlement of these scales will be made very quickly.

A contract has been awarded by the Trumbull Steel Co., Warren, Ohio, to the Hyde Park Foundry & Machine Co., Hyde Park, Pa., to supply machinery, castings and rolls for four sheet mills to be erected at the plant of the Liberty Steel Co., Trumbull county, acquired by the Trumbull company. All plans for the additions had been made by the Liberty Steel Co. before the sale of its plant.

Pittsburgh is the subject of a booklet issued by the Union Switch and Signal Co., Swissvale, Pa. It gives photographs with descriptions of the principal points of interest in the city of Pittsburgh.

## Chicago

CHICAGO, May 6—(By Wire).

Although purchases are still only for immediate needs, there is a growing feeling that accumulated deferred needs are becoming topheavy and that buying will soon be imperative. Mill operations continue on a low percentage basis. The leading interest is still operating at about 60 per cent, while the foremost independent, which was on a 65 per cent basis a week ago, is down to about 40 per cent.

Structural business is fair. The Inland Steel Co. has awarded the fabrication of 1000 tons rolled by itself for a warehouse at Indiana Harbor to the Morava Construction Co. The leading interest has booked 4700 tons of shapes for shipment to Japan and 4000 tons of plates for Canada. Twenty one hundred military cars for France, the construction of which had been suspended by the Government, have been reinstated. Inquiries for 1000 freight cars for Africa, as well as an unstated number for Mexico, are being circulated.

The latter part of last week local steel interests filed a petition with the Interstate Commerce Commission protesting against the Railroad Administration's Pacific export freight rates on finished material from Pittsburgh to the coast. It is pointed out that the new rate of 60c. per 100 lb. for certain iron and steel products shipped by the petitioners wipes out the 10c. differential which was in existence for years in favor of Chicago as against Pittsburgh. On the other hand, Pacific Coast business men are asking that the rate be reduced to 55c. Attention is also called by the Chicago petition to the rate for both export and domestic shipments from Chicago to Atlantic ports, which is 45c. per 100 lb., as against a rate of 27c. from Pittsburgh, a differential against Chicago of 18c. Complaint is not directed against the rates through Eastern ports, but a strong plea is made for the re-establishment of a differential in favor of Chicago on Western shipments, 12½c. being urged as fair and reasonable. The complaint was filed by the Inland Steel Co., the Steel & Tube Co. of America and the Interstate Iron & Steel Co. of Chicago, the Northwestern Barb Wire Co., Sterling, Ill., and the Keystone Steel & Wire Co., Peoria, Ill., as well as the Chicago Association of Commerce and the Illinois Manufacturers' Association.

Pig iron is beginning to show signs of weakness. Scrap continues to decline.

**Ferroalloys.**—Resale lots of ferromanganese and spiegeleisen can still be had at \$110 and \$35 delivered respectively. A concession of \$5 per ton has been made on resale Bessemer ferrosilicon, 10 per cent, the present price being \$44.75, or the same as for 10 per cent silvery. Producers continue to hold to prices with little activity in any of the ferroalloys.

We quote 80 per cent ferromanganese, resale, at \$110 to \$115, delivered; 50 per cent ferrosilicon, resale, at \$110, delivered, and 16 to 22 per cent spiegeleisen at \$35, furnace.

**Pig Iron.**—Although most sellers insist they are holding strictly to the recently established base, there is an undertone of weakness in the market. It is reported that a Southern producer may absorb a part of the freight to compete with Northern furnaces, but this has not yet been confirmed. Small lots of resale malleable have been sold recently at slightly below quotations. While a few producers have offered small amounts of iron with slight concessions in price, they have not found a ready market. Consumers are showing an indisposition to accept iron under those contracts which have not been revised to conform with the Industrial Board's suggested prices. There is little business in malleable and basic, and the demand for foundry is even weaker than heretofore. The tractor and agricultural implement industries, which heretofore have been rather active, have suffered a slump. Foundries serving the automobile industry, however, are still busy. The action of furnaces in making the present prices apply on undelivered portions of old orders has made consumers more willing to accept iron, the shipments in April being fairly good, but not so good as to prevent piling on furnace banks. The Woodward

Iron Co., which had its five furnaces out of blast for about five weeks, blew one of them in May 1. Charcoal iron makers reiterate that they are sold out for the first half. There have been considerable sales for second half delivery, however. Shipments on old contracts are going forward in a satisfactory manner. The leading Tennessee producer of silvery is now selling on the Jackson County base, making the uniform quotation on silvery, 7 per cent, \$41.55, Chicago.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, average silicon 1.50c, second half delivery, f.o.b. furnace, average freight to Chicago \$2.50 (other grades subject to usual differentials).....	\$29.25
Lake Superior charcoal, first half, nominal.....	38.85
Northern coke foundry, No. 1 silicon, 2.25 to 2.75 .....	35.00
Northern coke foundry, No. 2 silicon, 1.75 to 2.25 .....	26.75
Northern high-phosphorus foundry.....	26.75
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25.....	34.75
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75 .....	33.00
Southern foundry, silicon, 1.75 to 2.25.....	31.75
Malleable, not over 2.25 silicon.....	27.25
Standard Bessemer .....	27.95
Basic .....	25.75
Low phosphorus (copper free).....	48.25
Silvery, 7 per cent.....	41.55

**Plates.**—Mills are operating intermittently and the situation is not encouraging. The leading interest booked 4000 tons for Canada. In addition to the four vessels released for construction on the North Pacific Coast last week, 25 more ships suspended by the Government may be reinstated.

The mill quotation is 2.65c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 3.67c. for plates out of stock.

**Structural Material.**—The operation of mills continues irregular. Some work, however, necessitated by the building contemplated for this year, is being done, a few fair sized contracts developing from week to week. Among the encouraging features of the market is the release of 2100 military cars ordered by the Government for France, the construction of which had been suspended. An export order recently booked by the leading interest calls for 4700 tons of shapes for shipment to Japan. Inquiries for 1000 freight cars for Africa are now being circulated in this country through New York. Mexico is also in the market for a number of cars. The Morava Construction Co., Chicago, will fabricate 1000 tons to be used in the construction of a warehouse for the Inland Steel Co., the steel having been rolled by the latter company. The Pacific Iron Works, Portland, Ore., has a contract for 439 tons for the Toledo bridge, Toledo, Wash., to be constructed by Lewis County. T. G. Warden, Fort Dodge, Iowa, will erect an addition to a hotel calling for 156 tons of reinforcing steel. A contract has been awarded for the fabrication of 378 tons for a pavilion at Oakland, Cal., to be erected by the Archon Co. An order has been placed for 572 tons of reinforcing steel for the Clift Building, Salt Lake City, Utah.

The mill quotation is 2.45c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.47c. for material out of warehouse.

**Bars.**—The mills are operating intermittently, with little change in the demand. The agricultural implement industry has suffered a considerable decline in business as the result of the conservatism of farmers. The disposition to defer orders for agricultural machines is evidenced by a heavy demand for parts, these being in some cases for machines manufactured 10 or 20 years ago. Rail-carbon mills are beginning to feel the effects of a growing demand for reinforcing bars to be used in connection with concrete construction projects contemplated for this year.

Mill prices are: Mild steel bars, 2.35c., Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.50 to 2.60c.; Chicago: rail carbon, 2.45c., mill. Jobbers quote 3.37c. for steel bars out of warehouse.

**Sheets.**—Consumers continue to buy only for immediate needs. The demand is not notable in any direction and comes from miscellaneous sources.

**Wire Products.**—Orders are numerous, but jobbers continue to buy in small lots, asking for immediate delivery. It is believed that the conservative policy observed by them this spring will mean a continuation of activity during the summer, because the demand for wire products is good, as evidenced by the number of "repeat" orders. Barb wire, particularly, is in demand at present, and there is a growing business in wire nails. For mill prices, see Finished Iron and Steel, f.o.b. Pittsburgh, page 1262.

**Rails and Track Supplies.**—Railroad purchasing agents still await authority from the Railroad Administration to fill rail requirements. The Pennsylvania Railroad, alone, contemplates the purchase of 110,000 tons, and other lines are in need of heavy tonnages. The demand for light rails is small, as the principal consumers, the coal mines, have curtailed operations. It is expected, however, that coal users who are now deferring purchases in the hope of price reductions will order heavily in the fall. The base price on light rails remains 2.45c. f.o.b. makers' mills, with the differentials established by the Government still effective. There continues to be some activity in track specialties, among recent inquiries being one for 1500 to 2000 kegs of spikes.

Standard railroad spikes, 3.35c., Pittsburgh. Track bolts with square nuts, 4.35c., Pittsburgh. Steel tie plates and iron angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 2.75c., f.o.b. makers' mills. Light rails, 2.45c., f.o.b. makers' mills, with usual extras.

**Old Material.**—The market continues to weaken, with consumers still inactive. Further reductions have taken place in a number of items. Railroad offerings this week include 1200 tons by the Santa Fé, 600 tons by the Burlington, 400 tons by the Chicago & Great Western and 200 tons each by the Wabash, Belt Railroad of Chicago and Soo Line. The Wabash list includes wheels only. The Erie has also issued a list, the tonnage not being specified.

#### Per Gross Ton

We quote delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Iron rails	\$21.00 to \$22.00
Relaying rails	35.00 to 45.00
Carwheels	21.00 to 22.00
Steel rails, rerolling	17.50 to 18.00
Steel rails, less than 3 ft.	17.50 to 18.00
Heavy melting steel	15.50 to 16.00
Frogs, switches and guards cut apart	15.50 to 16.00
Shoveling steel	15.00 to 15.50

#### Per Net Ton

Iron angles and splice bars	\$17.75 to \$18.75
Steel angle bars	15.00 to 15.50
Iron arch bars and transoms	22.00 to 23.00
Iron car axles	26.50 to 27.50
Steel car axles	23.00 to 24.00
No. 1 busheling	13.00 to 13.50
No. 2 busheling	9.00 to 9.50
Cut forge	14.00 to 14.50
Pipes and flues	11.50 to 12.00
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	14.00 to 14.50
Steel knuckles and couplers	15.75 to 16.25
Coil springs	17.00 to 17.50
No. 1 cast	20.00 to 21.00
Boiler punchings	18.00 to 19.00
Locomotive tires, smooth	16.50 to 17.00
Machine shop turnings	5.50 to 6.00
Cast borings	8.25 to 8.75
Stove plate and light cast	15.50 to 16.00
Grate bars	15.00 to 15.50
Brake shoes	13.75 to 14.25
Railroad malleable	15.00 to 16.00
Agricultural malleable	15.00 to 15.50
Country mixed	10.00 to 11.00

**Cast-Iron Pipe.**—Akron, Ohio, which was in the market for 4570 tons, has awarded a contract to the T. E. M. Schaffery Co., that city. It is expected that St. Paul, Minn., which has been inquiring for from 500 to 1000 tons, will make an award to-day. Other lettings scheduled for to-day include 350 tons at Jackson, Mich., 250 tons at Kalamazoo, Mich., and 70 tons at Faribault, Minn. Detroit will let 1000 tons to-morrow, and Brainerd, Minn., 1000 to 2000 on May 8.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., \$59.80; 6-in. and larger, \$56.80; class A and gas pipe, \$1 extra.

**Bolts and Nuts.**—There continues to be a fair demand from jobbers, who are making numerous purchases in small lots. The automobile and automobile accessory industries are purchasing a round tonnage of nuts. For mill prices see Finished Iron and Steel, f.o.b. Pittsburgh, page 1262. Jobbers quote:

Structural rivets, 4.77c.; boiler rivets, 4.72c.; machine bolts up to  $\frac{3}{4}$  x 4 in., 50 per cent off; larger sizes, 40 off; carriage bolts up to  $\frac{3}{4}$  x 6 in., 40 and 10 off; larger sizes 35 off; hot pressed nuts, square tapped, \$1.73 off; hexagon tapped, \$1.73 off; coach or lag screw, gimlet points, square heads, 50 and 10 per cent off. Quantity extras for nuts are canceled.

## Philadelphia

PHILADELPHIA, May 6.

While awaiting the outcome of the conference on Thursday between steel manufacturers and representatives of the Railroad Administration on rail prices, the steel trade chooses to disregard present dullness as much as possible and look ahead to the prosperity that all feel is certain to come when the expected buying movement is given momentum. This momentum must come, it is believed, both from outside influences such as the signing of the peace treaty and the conviction in the minds of buyers that prices are as low as they will go. Steel manufacturers' representatives in this market are positive in their assertions that there will be no important concessions from present prices. Most, if not all, of the larger companies apparently have adopted the policy of turning away all requests for concessions of any kind, while the smaller producers are hindered by high costs from making cuts. The result is that in the face of one of the dullest periods the steel trade has ever passed through prices remain remarkably firm. There is the usual crop of rumors as to price concessions, but it is stated positively by all of the leading sellers in this market that they are adhering strictly to the schedule announced in Washington on March 20 as a result of conferences between the steel trade and the Industrial Board of the Department of Commerce. One company says it has refused an offer of 2.25c., Pittsburgh, for 10,000 tons of merchant steel bars; another refused a tonnage of plates at 2.10c., Pittsburgh, while two exporters state that they have been unable to place firm offers from Great Britain at prices which would be about \$5 a ton under the regular schedule of prices. Some sellers say there will be no open market in the sense that there will be ruthless cutting of prices, and there are not a few predictions that prices will eventually be higher rather than lower. If the controversy as to prices of railroad material is ended by the conference on Thursday, a fair amount of new tonnage is expected to be placed. The Navy Department, for example, has announced that it is holding up a large tonnage of battleship steel, about 45,000 tons, until the price question is settled. The pig iron trade is extremely quiet and the tendency of prices is downward.

**Pig Iron.**—The outstanding fact in the pig iron market is that there are so few inquiries and so little business is being placed that present quotations give no idea of what producers might be willing to do if attractive business were in sight. Most of the business being placed, which is mainly in carload lots, is going to Western Pennsylvania furnaces whose quotation of \$26.75, furnace, for No. 2 plain iron, with a freight rate of \$2.80, makes their delivered price \$29.55 as compared with \$30.65 which Eastern Pennsylvania furnaces continue to quote. Some of the Eastern Pennsylvania furnaces undoubtedly would cut this price for a fairly large tonnage, but under present conditions they are more interested in protecting the business on their books than in cutting prices to pick up the small lots now being offered. The sale of a few hundred tons of No. 2 X iron to a Baltimore foundry at about \$30, delivered, is reported but not confirmed. This would be about \$1.70 under the price quoted by Eastern Pennsylvania furnaces, the Pittsburgh-Baltimore freight rate being \$3.70. Some contracts for low-phosphorus pig iron are being cancelled for a consideration of \$10 a ton. One furnace is cancelling all of its contracts and will blow out soon. We quote standard grades of iron as follows, all being

for delivery in the Philadelphia district, except low phosphorus iron, which is quoted f.o.b. furnace:

Eastern Penna. No. 2 X (2.25 to 2.75 sil.)	\$31.90
Eastern Penna. No. 2 plain (1.75 to 2.25 sil.)	30.65
Virginia No. 2 X (2.25 to 2.75 sil.)	31.60
Virginia No. 2 plain (1.75 to 2.25 sil.)	30.60
Basic	29.65
Gray forge	29.65
Standard low phosphorus (f.o.b. furnace)	46.75
Copper-bearing low phosphorus (f.o.b. furnace)	43.75

**Ferroalloys.**—Small lots of resale ferromanganese are still being sold, the price now ranging from \$105 to \$110, but consumers have in some instances tried to buy at \$100 or under. Spiegeleisen is offered in the Central West at \$33, f.o.b. shipping point. Producers are still asking \$150, but are doing practically nothing. So far as known only one carload was sold at this price in this market within the past week.

**Ore.**—More Brazilian manganese ore is arriving than can be absorbed, and resale lots could be bought at around 50c. a unit, but consumers are not interested. We note the arrival last week of 2200 tons from Brazil, valued at \$64,580.

**Billets.**—There has been no demand in the past week and no sales of importance. Quotations seem to be without exception on the basis of \$38.50, Pittsburgh, or \$42.50, Philadelphia, on 4 x 4-in. open-hearth rerolling billets.

**Plates.**—The Navy Department has awarded to the Carnegie Steel Co. orders for approximately 9200 tons of special treatment protective deck plates and 5000 tons of nickel steel plates for battleships Nos. 49, 50, 51 and 52. An order for about 20,000 tons of carbon steel plates and shapes is held in abeyance pending the final decision on steel prices which presumably will be reached at the conference between the Railroad Administration and steel manufacturers on Thursday. Although production of plates in this district is about on a 25 per cent basis the steel mills are refusing to cut prices. A local mill declined a tonnage offered at 2.10c., Pittsburgh. We quote sheared plates ¼-in. and heavier at 2.895c., Philadelphia.

**Structural Material.**—The Dupont interests, it is reported, will build a 2400-room hotel at Atlantic City. Bids for the steel have not yet been taken. The Bethlehem Fabricators, Inc., Bethlehem, Pa., has been awarded the contract for the Kenilworth Pier, Philadelphia, about 1600 tons. A slight improvement in fabricating jobs is reported, but most of the fabricating shops are still working at a small percentage of capacity. We quote plain material at 2.695c., Philadelphia.

**Bars.**—An Eastern mill has refused an offer of 2.25c., Pittsburgh, for 10,000 tons of soft steel bars. Prices are said to be firmly held. There are rumors of concessions, but these are difficult to verify. The two Eastern bar iron mills which were closed a few weeks ago by a strike are still shut down. Very little business in bar iron is being done. We quote soft steel bars and bar iron at 2.595c., Philadelphia, double refined bar iron being quoted 1c. per lb. higher.

**Sheets.**—The market is very quiet, orders being few and for small lots only. The Republic Iron & Steel Co. is now offering in this district the sheet products of the Deforest Sheet & Tin Plate Co., which it has purchased. Prices quoted on mill shipments for delivery in the Philadelphia district are as follows: No. 10 blue annealed, 3.795c.; No. 28 black, 4.595c.; No. 28 galvanized, 5.945c.

**Old Material.**—There is no demand from the mills, and prices are weaker. The little buying that is being done is by dealers for delivery on contracts. The Pennsylvania Railroad has issued its May list, which is larger than for some time past, being about 15,000 tons. The plan inaugurated during the war of asking for bids f.o.b. consumers' works is still being adhered to. The first offering of Government scrap in this district under the plan proposed by scrap dealers, namely by sealed proposals, has been made by the Baltimore office of the Ordnance Department. Bids close May 15. About 2000 tons of scrap was sold this week by the Frank-

ford Arsenal, Philadelphia. We quote prices as follows for delivery at consumers' works in eastern Pennsylvania:

No. 1 heavy melting steel	\$15.00 to \$15.50
Steel rails, rerolling	17.50 to 18.00
No. 1 low phosphorus, heavy, 0.04 and under	22.50 to 23.00
Iron rails	20.00 to 22.00
Carwheels	22.00 to 23.00
No. 1 railroad wrought	21.00 to 22.00
No. 1 yard wrought	19.00 to 20.00
Country yard wrought	12.00 to 15.00
No. 1 forge fire	12.00 to 13.00
Bundled skeleton	12.00 to 13.00
No. 1 busheling	15.00 to 16.00
No. 2 busheling	13.00 to 14.00
Turnings (short shoveling grade for blast furnace use)	10.50 to 11.50
Mixed borings and turnings (for blast furnace use)	9.50 to 10.00
Machine-shop turnings (for rolling mill use)	10.50 to 11.00
Cast borings (clean)	12.50 to 13.50
No. 1 cast	21.50 to 22.50
Grate bars	17.00 to 18.00
Stove plate	17.00 to 18.00
Railroad malleable	18.00 to 19.00
Wrought iron and soft steel pipes and tubes (new specifications)	18.00 to 18.50
Ungraded pipe	13.00 to 14.00

## Cleveland

CLEVELAND, May 6

**Iron Ore.**—There is no activity whatever in the ore market and shippers are making no effort to effect sales. Some consumers are feeling out the market in an effort to get lower prices than the regular quotations, but without success. Some resale ore, mostly of a high manganese grade, is on the market and can be bought at about \$1 per ton below regular prices. However, it is stated that only about 100,000 tons of resale ore has so far come on the market. Ore shipments during April were 1,412,239 gross tons, being the largest movement ever made in that month with the exception of April, 1916, when the shipments were 1,658,411 tons. In 1918 the April shipments were only 235,870 tons. The large April movement was due almost entirely to the activity of the Steel Corporation, which made nearly all the shipments. Merchant ore firms so far have moved only a very few cargoes and one of the large shippers has not yet ordered the sending of cars to the mines for ore. Outside of the Steel Corporation the May shipments will be very light. Ore prices delivered f.o.b. lower Lake ports, are as follows:

Old range Bessemer, \$6.45; old range non-Bessemer, \$5.70; Mesaba Bessemer, \$6.20; Mesaba non-Bessemer, \$5.55.

**Pig Iron.**—The pig iron market is almost at a standstill. The only sales reported during the week were a few small lots of foundry iron for early shipment. One producer with several furnaces sold only 500 tons in a week and others did no better. Inquiry is very light, although a northern Ohio steel plant is in the market for from 5000 to 6000 tons of basic per month, this being the first basic inquiry that has developed in this territory for weeks. With the absence of demand and growing stock piles, more furnaces are going out of blast. During the past week three stacks controlled by Cleveland interests were blown out, M. A. Hanna & Co. putting out their Dover furnace on April 30, and one Detroit furnace on May 1, and Pickands, Mather & Co. blowing out Toledo furnace A on May 3. The latter furnace, which has been in steady operation four and a half years, will be relined and undergo extensive repairs. The McKinney Steel Co. is now operating only four of its eight furnaces located in Cleveland and other points. An inquiry from the National Sanitary Mfg. Co. for 1000 tons of No. 2 foundry iron for May shipment for its Louisville plant brought out offers of considerable resale iron and it is understood that this company was able to buy this iron at close to \$25. Tennessee and Virginia furnace interests are quoting iron f.o.b. furnace instead of using Birmingham as a basing point, giving buyers a freight advantage of from 40c. to 90c. in this territory, and in addition one Vir-

for scrap would follow. In fact, they incline to the opinion that this will be the outcome and that business producer is naming prices from 25c. to \$1.25 below regular quotations. Southern producers so far have resisted the efforts of consumers to secure a revision of contracts from the last Government price to present prices. Considerable resale ferroalloy is still undisposed of in this territory and is being offered at a sharp reduction in prices, but resale silvery iron has been well cleaned up. We quote delivered Cleveland, as follows:

Bessemer .....	\$29.35
Basic .....	27.15
Northern No. 2 foundry .....	27.15
Southern No. 2 foundry, silicon 2.25 to 2.75 .....	31.00
Gray forge .....	26.15
Ohio silvery, silicon 8 per cent .....	42.65
Standard low phos., Valley furnace .....	45.75

**Coke.**—There is no demand for either foundry or furnace coke. Prices are unchanged. Standard Connellsville foundry coke is held at \$5 to \$5.50 per net ton at oven for the best grades, and Wise County coke at \$6.

**Bolts, Nuts and Rivets.**—The demand for bolts and nuts continues very light, being limited to small orders for early requirements. Some price shading is reported, but leading producers appear to be adhering to regular prices. Some of the bolt and nut works are operating at only about 50 per cent of capacity. Specifications for rivets are coming out in fair volume, but old orders are being cleaned up rapidly and little new business is being placed.

**Finished Iron and Steel.**—The demand for steel bars for reinforced concrete work is still the most active feature of the market. J. E. Heyworth, Chicago, was the low bidder for the North Hill viaduct in Akron requiring 1500 tons of bars, which will be placed shortly. Sewer work in Detroit requiring 300 tons of bars has been placed with Detroit contractors. The Carmichael Construction Co., Akron, has taken a garage in that city requiring 400 tons, and the B. F. Goodrich Rubber Co. will require 700 tons for a garage. In structural steel, the Riverside Bridge Co. has taken 365 tons for a building for the General Fire Extinguisher Co., Warren, and the Fort Pitt Bridge Works, 85 tons for a building for the Western Automatic Machine Tool Co., Elyria, Ohio. The Trumbull Steel Co., Warren, has taken bids for 1900 tons for a plant extension. Local sales include 1000 tons of wire rods and 350 tons of bolt wire. A traction line is inquiring for 200 tons of standard rails. Mills are getting a fair volume of small orders, largely for bars and structural material. Stocks of many manufacturers are getting low, but they are buying in very small lots, expecting a possible further reduction in prices. However, there are no reports of price shading on bars, plates and structural material. Plates are in light demand. Strip mills, which have been taking sheet orders, have now become competitors of plate mills for automobile frame steel, quoting the plate base price for hot-rolled strip steel in narrow widths. The demand for sheets is light except for finished sheets for automobiles, and some sheet mills are meeting the prices of plate mills that are quoting the plate differentials instead of blue annealed prices on heavy gage sheets. Hard steel bar prices are firm at 2.25c. Wire and fence are in good demand. Warehouse prices are as follows:

Steel bars, 3.27c.; plates, 3.57c.; structural shapes, 3.87c.; bands and hoops, 3.97c.; No. 10 blue annealed sheets, 4.47c.; No. 28 black sheets, 5.27c.; No. 28 galvanized sheets, 6.62c.

**Old Material.**—The scrap market continues dull and prices show a tendency towards weakness. Local yard dealers are still laying down stocks of heavy melting steel, although some of the yards already have very large stocks. Cleveland mills are buying small lots of material and are offering \$14.50 for heavy melting steel and \$8 for turnings. Some turnings sold during the past few days at \$8.50 and borings at \$10. The first sale of busheling reported in the local market for some time was made during the week at a reported

price of \$14.50. Mills are taking shipments fairly well and some of the dealers have their old orders nearly cleaned up. We quote, delivered consumers' yards in Cleveland and vicinity, as follows:

Heavy melting steel .....	\$14.50 to \$15.00
Steel rails, under 3 ft. ....	15.50 to 16.25
Steel rails, rerolling .....	15.50 to 16.00
Iron rails .....	23.00 to 24.00
Iron car axles .....	29.50 to 30.00
Steel car axles .....	27.50 to 28.50
Low phosphorus melting scrap .....	16.25 to 17.00
Cast borings .....	9.75 to 10.25
Iron and steel turnings and drillings .....	8.00 to 8.50
Compressed steel .....	12.50 to 13.00
No. 1 railroad wrought .....	17.00 to 17.50
Cast iron car wheels .....	22.00 to 22.50
Agricultural malleable .....	14.00 to 15.00
Railroad malleable .....	17.00 to 17.50
Steel axle turnings .....	13.00 to 13.50
Light bundled sheet scrap .....	10.00 to 11.00
No. 1 cast .....	21.00 to 22.00
No. 1 busheling .....	13.75 to 14.25
Drop forge flashings, 10 in. and under .....	13.00 to 13.50
Drop forge flashings, over 10 in. ....	9.50 to 10.00
Railroad grate bars .....	16.00 to 16.50
Stove plate .....	16.75 to 17.50

## Buffalo

BUFFALO, May 5.

**Pig Iron.**—Most producing interests report the market as still in a decidedly dull and listless state, with very little new business in sight; although a few state there are some signs of encouragement in the way of special mixtures ordered in small lots, some foundries requiring high phosphorous iron, etc., to mix in their melt, although as a rule they have ample stocks of regular grades for present needs, especially as current business is only about 35 per cent of normal according to statements made by a good many of the melters of the district. Furnaces report such a small proportion of capacity output is being ordered that they are operating only 50 to 60 per cent of capacity as a rule, only one producer operating all of its stacks, and it is likely there will be an increasing number of stacks out of blast unless there is a speedy change for the better. The Wickwire Steel Co. expects to shut down its second furnace in about one week, as it will have sufficient iron in stock to care for its steel plant needs and for shipment on contracts for some time ahead. So far as can be learned, there is no shading of prices from the stipulated schedule of March 21. We quote as follows, f.o.b. furnace, Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon .....	\$29.75
No. 2 X, 2.25 to 2.75 silicon .....	28.00
No. 2 plain foundry, 1.75 to 2.25 silicon .....	26.75
Gray forge .....	25.75
Malleable, silicon not over 2.25 .....	27.25
Basic .....	25.75
Basic, 1 to 1½ per cent manganese .....	26.25
Basic, 1½ to 2½ per cent manganese .....	26.75
Bessemer .....	27.95

**Finished Iron and Steel.**—Business has come to a practical standstill again due to the situation in prices which awaits the meeting of the steel interest representatives with the Railroad Administration at New York this week; no one apparently being willing to make purchases for the replenishment of stock pending the result of the conference. The fact that so many principals among both producers and users of material are at present actively engrossed in the work of the Fifth Liberty Loan campaign is also having an effect on business and contributes to the result of a duller market than has been experienced for a few weeks past.

Steel bars, 3.45c.; iron bars, 4.15c.; shapes, 3.55c.; plates, 3.75c.; No. 10 blue annealed sheets, 4.65c.; No. 28 black, 5.70c.; No. 28 galvanized sheets, 7.05c.

**Old Material.**—The market shows very little demand from local consumers except for cast scrap for which there is a fair inquiry. There is also some outside demand for turnings and borings. For other commodities the market is dull and characterized by a waiting attitude on the part of consumers. Dealers are anxious that the price imbroglio on finished materials be speedily settled, or left to an open market status, believing that in the latter event a more active demand

ness will not be held back much longer and that a scrap buying movement will ensue. There are no changes in prices and we quote the current schedule as asked by dealers as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel, regular grades..	\$14.50 to \$15.50
Low phosphorus, 0.04 and under.....	21.00 to 22.00
No. 1 railroad wrought.....	19.00 to 19.50
No. 1 machinery cast.....	21.00 to 22.00
Iron axles.....	23.00 to 24.00
Steel axles.....	23.00 to 24.00
Carwheels.....	21.00 to 22.00
Railroad malleable.....	17.00 to 18.00
Machine shop turnings.....	8.50 to 9.50
Heavy axle turnings.....	13.00 to 14.00
Clean cast borings.....	11.00 to 12.00
Iron rails.....	21.00 to 22.00
Locomotive grate bars.....	16.00 to 17.00
Stove plate.....	18.50 to 19.00
Wrought pipe.....	13.00 to 14.00
No. 1 busheling.....	13.00 to 14.00
Bundled sheet stamping.....	11.00 to 12.00

## New York

NEW YORK, May 6.

**Pig Iron.**—So far as there is any change in the market it is for the better, at least in a sentimental way. One firm has an inquiry for 500 tons of malleable for delivery during the next three or four months to a New York State melter, 100 tons of Bessemer ferro-silicon for prompt delivery and 1000 tons of foundry for delivery to a New York State melter in the last quarter. Occasional sales are made, but all are for small quantities and include a few lots for export. Prices are unsteady and are influenced somewhat by the appearance of resale lots. This is particularly true of ferrosilicon and special grades. We quote as follows, delivered New York, for Northern and Southern grades:

No. 1 foundry, silicon, 2.75 to 3.25.....	\$31.55
No. 2 X, silicon, 2.25 to 2.75.....	29.80
No. 2 plain, silicon, 1.75 to 2.25.....	28.55
No. 2 X, Virginia, silicon, 2.25 to 2.75, \$31.90 to 32.40	
No. 1 Southern, silicon, 2.75 to 3.25.....	37.45
No. 2 Southern, soft (all rail), sil. 2.25 to 2.75.....	35.70
No. 2 Southern (all rail), sil., 1.75 to 2.25.....	34.45

**Cast Iron Pipe.**—Cast iron pipe manufacturers are making an effort to keep their employees busy, but find it impossible to sell all of the pipe that is being made. Hence considerable tonnages are being piled as stock, awaiting the improvement in demand which, it is believed, cannot be long delayed. Nominal quotations New York are as follows: 6-in. and heavier, \$57.70; 4-in., \$60.70; 3-in., \$67.70, and \$1 additional for class A and gas pipe.

**Ferroalloys.**—Sales and inquiries for both ferromanganese and spiegeleisen continue to be confined to carload lots for early delivery. No sales of ferromanganese have been heard of in this market in the last week but dealers have before them several inquiries for carload lots. Producers continue to quote \$150, delivered, for the higher analysis alloy but it is acknowledged that resale material can still be found at about \$110, delivered, to fill the small business that is appearing. In the spiegeleisen market there have been sales of several carload lots in the past week at prices ranging from \$35 to \$40, delivered, some of this having been resale material. The monthly blast-furnace report of THE IRON AGE indicates that the production of ferromanganese and spiegeleisen in April was nearly 17,500 tons, of which over 14,500 tons was ferromanganese, a considerable decline from the first three months of the year but still a large output. Of the 24 companies which in the height of the output a year or so ago were producing these alloys in the United States, only six are now reported so doing. Ferrosilicon 50 per cent is still obtainable at \$90, delivered, for spot or future delivery. The 15 per cent electric alloy is quoted at \$55, delivered. The market is exceedingly quiet.

**High-Speed Steel.**—Domestic business is at a minimum and amounts to less than in the dull period of 1914 preceding the war. Although some interests report occasional export orders, most business in countries abroad is being taken by the Sheffield plants in

England, which are quoting about 4s. (95c.) f.o.b. mill. On this basis they are selling at points as far distant as the Orient at delivered prices that are less than quotations f.o.b. Pittsburgh. The British interests are particularly strong in the countries of southern Europe, where they hold virtually a monopoly of the trade. In Scandinavia and Switzerland some orders are being let to mills in this country. It is stated that there is a strong sentiment in these countries for the American steels, but that no adequate effort is being made to secure the business. It is a question as to whether for a long time to come demand will equal the expanded high-speed steel mill capacity. Government resale stock is selling around \$1 per lb., and to some extent cuts down new business. We quote high-speed steel at \$1.55 to \$1.60 per lb., attractive business tending to bring out even lower figures.

**Warehouse Business.**—Although jobbing activity is only for a limited tonnage, sentiment through the trade looks forward to a slowly increasing demand in the coming weeks. Some complaint is found at the continued negotiation between the Railroad Administration and steel interests with a possible further manipulation of prices. As regards structural shapes one large dealer reports several orders for carload lots, the first of that size placed locally since the price stabilizing efforts were started. In many lines there is an appreciable amount of inquiry, although a lot of it is classified as "nibbling." It is remarked that occasionally business is now being placed personally by customers with jobbers, who for a long time have been compelled to go out and seek it themselves. Prices are unchanged. We quote out-of-store as follows: No. 10 blue annealed sheets, 4.57c.; No. 28 black sheets, 5.37c.; No. 28 galvanized sheets, 6.50c.; steel bars, 3.37c.; structural shapes, 3.47c.; plates, 3.67c.; bands, 3/16 in., Nos. 10 and 12, 4.07c.; shafting, net list.

**Old Material.**—The market is still a waiting one. Only a forward movement along the entire steel industrial line can stimulate the scrap market, according to prevailing opinion. Meanwhile prices remain in a state of inertia, waiting for marked influences to either force them up or pull them down. Borings and turnings, and possibly heavy steel, show the most activity. The recent flurry in the demand for cast iron scrap is over. Sales do not seem as heavy as they were 10 days ago. Brokers' and dealers' buying prices, New York, follow:

Heavy melting steel.....	\$11.50 to \$12.50
Rerolling rails.....	14.50 to 15.00
Relaying rails, nominal.....	38.00 to 40.00
Steel car axles.....	19.00 to 20.00
Iron car axles.....	24.00 to 25.00
No. 1 railroad wrought.....	18.50 to 19.00
Wrought iron track.....	13.50 to 14.50
Forge fire.....	8.50 to 9.00
No. 1 yard wrought, long.....	15.50 to 16.00
Light iron.....	6.00 to 6.50
Cast borings (clean).....	9.00 to 9.50
Machine shop turnings.....	7.50 to 8.00
Mixed borings and turnings.....	7.50 to 8.00
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long....	14.00 to 15.00
Stove plate.....	15.50 to 16.00
Locomotive grate bars.....	15.00 to 15.50
Malleable cast (railroad).....	12.50 to 13.50
Old carwheels.....	20.00 to 20.50
Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:	
No. 1 machinery cast.....	\$21.00 to \$22.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	20.00 to 21.00
No. 1 heavy cast, not cupola size.....	14.50 to 15.00
No. 2 cast (radiators, cast boilers, etc.).....	16.00 to 17.00

**Finished Iron and Steel.**—Buyers are making quite an effort to secure concessions from ruling prices, but practically no weakness has been discovered. In some cases the offers have not been taken seriously by representatives of the mills. A wide range of prices has, however, been noted in alloy steel. In the case of a few hundred tons of nickel steel bars which have been held at prices ranging from 5.50c. to 6.50c., a quotation under 5c. has been met by several mills and at this writing it would appear that the business would be settled at some point between 2.25c. and 2.50c. above the soft steel bar base. Some 20,000 tons of 60 and 70 lb. rails for Japan has not yet been closed. The fabri-

cating trade is apparently figuring heavily on lower prices, at least the figures which they are naming, presupposing, in the opinion of the structural steel trade, a revision in prices of the plain material. Some activity is noted in railroad buying of bolts and spikes, but prices are being well maintained. The tank work in the market for oil companies is estimated to involve several thousand tons. Active inquiry is noted for fabricated steel for export, for sugar mills and other industrial work. Post & McCord have been awarded 700 tons for hangars at Hampton, Va., and new work in fabricated lines includes 400 tons for the Lehigh Valley, 350 tons for the Boston & Maine and a Washington Avenue bridge, New Haven, involving 115 tons. We quote mill shipments as follows: Bar iron, refined grade, 2.62c.; double refined bar iron, 3.62c.; soft steel bars, 2.62c.; shapes, 2.72c.; plates, 2.92c., all New York.

## Birmingham

BIRMINGHAM, ALA., May 5.

**Pig Iron.**—A slightly better tone prevails in the Southern iron market without special cause, other perhaps, than conviction that noticeable improvement in the pipe trade seems the early forerunner of a considerable melt in that field and the precursor of activity by municipal and private enterprise. Sales during the week, while the volume is still not large, were more numerous, indicating decrease in stocks at foundries more widespread than heretofore noted. All effort at export business is still futile, owing to high ocean freights and makers have given up hope in that direction until there is a change. Southern makers are holding to the market price with apparent regularity. They take the view that it would be suicidal to cut prices on the little business that is going. Practically all the orders are for prompt shipment. The trade has accepted the continuance of the silicon differentials. It was fully expected that Tennessee and Virginia furnaces would waive the freight rate differential over Birmingham. When a real volume of business again maintains, these differentials will be considered and given due weight. One of the idle stacks of the Woodward Iron Co. has resumed in order to care for regular customers and metal booked some time ago as well as the small orders that have come in from time to time. On the other hand, the Republic company blew out one of the two active stacks at Thomas, which makes the active list remain at 16. It is understood that the leading interest will resume on another Bessemer stack for the manufacture of ferromanganese. There is little or no interest in additional conferences with Mr. Hines, but there is a decided increase in the hope that the Government will get out of the price regulating game altogether. The average stage of operations at steel works remains around 60 to 70 per cent with Ensley and Fairfield mills at nearly normal. We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, 1.75 to 2.25 silicon.....	\$26.75
Basic.....	25.75

**Coal and Coke.**—Foundry coke is slightly more active, judging from the increasing number of orders for prompt shipment from regular customers. The basic price remains at \$8. Furnace coke is necessarily slow. Domestic coal is active; steam coal slow.

**Cast Iron Pipe.**—Sanitary pipe makers report deliveries during April of as much pipe as during the entire first quarter and a distinct improvement in demand. One iron maker says this has been reflected in the ordering out for prompt delivery of held-back tonnage. Water pipe inquiries are more numerous and the volume inquired for is greater. Local industrial plants have just taken around 1000 tons. Houston is inquiring and Beaumont is after flange pipe. The leading interest has also booked additional orders for sugar house castings for Cuba.

**Old Material.**—The scrap market continues listless with a slight improvement in the demand for heavy melting steel and a fractional advance in price. Scrap steel rails are also quoted \$1 higher and No. 1 cast

and stove plate move in good quantities. We quote per gross ton f.o.b. Birmingham district yards, prices to consumers, as follows:

Steel rails .....	\$12.00 to \$12.50
No. 1 heavy steel.....	11.50 to 12.00
Cast iron borings .....	6.00 to 6.50
Machine shop turnings.....	6.00 to 6.50
Stove plate .....	13.00 to 13.50
No. 1 cast.....	19.00 to 19.50
Car wheels .....	19.00 to 19.50
Tramcar wheels .....	18.00 to 18.50
Steel axles .....	17.00 to 18.00
No. 1 wrought.....	12.00 to 13.00

## Cincinnati

CINCINNATI, May 6—(By Wire).

**Pig Iron.**—A sanitary manufacturing company that was in the market last week for 1000 tons of foundry iron for May shipment to Louisville is understood to have purchased part of this iron, but, if any was bought, the order was not passed through local sales offices. A number of reports are still afloat that some Southern furnaces are willing to make reductions, but definite information as to this is lacking. However, a little foundry iron that was crowded on customers who had contracts for more than they could absorb is known to have been resold at a loss, but little, if any, of this tonnage came into this territory. Market conditions are probably quieter than they have been during the past six months. As far as the foundry and basic melters in this vicinity are concerned, they have sufficient stocks in hand or due them to fill their wants for the next three months, so that new business is now confined to very small tonnages for prompt shipment. With the exception of a few tentative inquiries for last half shipment, no interest is taken by either the buyer or seller for that delivery. A few scattered lots of Ohio silvery iron have been placed and none of the furnaces is cutting the regular schedule of prices. Agricultural implement makers may come into the market for a limited amount of iron later. It is understood that not all of them are as well provided as other classes of melters. Further curtailment of production in the South is contemplated but no additional definite plans of southern Ohio furnaces as to closing down have been given out.

Based on freight rates of \$3.60 from Birmingham and \$1.80 from Ironton, we quote, f.o.b. Cincinnati:

Southern coke, silicon 1.75 to 2.25 (base price).....	\$20.35
Southern coke, silicon 2.25 to 2.75 (No. 2 soft).....	31.60
Southern gray forge .....	29.35
Ohio silvery, 8 per cent silicon.....	42.05
Southern Ohio coke, silicon 1.75 to 2.25 (No. 2).....	28.55
Basic, Northern .....	27.55
Standard Southern carwheel .....	51.60

**Coke.**—Occasionally a few carloads of foundry coke for prompt shipment are sold, but contracting at the present time seems to be out of the question. No furnace coke for any delivery has been sold in this territory within the past week, and very little business for either furnace or foundry coke for future shipment is under negotiation. Prices are stationary and Connellsville 48-hr. coke ranges from \$3.75 to \$4 per net ton at oven, although some off grades loaded on cars can be bought at \$3.50. The average price for 72-hr. coke in that district is around \$5.50, but the range in quotations runs from \$5 to \$6 per ton. New River operators are still holding off and are not quoting any furnace coke, and are holding foundry around \$7.50 to \$8. Wise County and Pocahontas prices are about the same, and from \$5 to \$5.50 is quoted on 48-hr. coke and from \$6 to \$6.50 on 72-hr. grades. No immediate change is expected in any field.

**Finished Material.**—The jobbers report that everyone is still playing a waiting game, and they are only receiving orders for material that is urgently needed. Mill representatives report a better feeling in the trade, as is shown by specifications coming in on old contracts. However, their sales are very much limited, and in many cases where customers formerly ordered in carload lots they are now paying the extra price as well as the higher freight rate, and are purchasing less than carlot quantities. The sheet mills

in this vicinity feel a little more encouraged over the outlook, as their prompt business shows some improvement, and there is also some interest taken in the future. No. 28 black sheets are quoted at 4.35c. Pittsburgh basis, and No. 28 galvanized at 5.70c., with a freight rate of 23c. per 100 lb. and under. Wire nails are moving a little more freely on account of the open weather that has stimulated building operations to some extent.

The following are present local jobbers' prices: Steel and iron bars, 3.33c. base; bands, 4.03c. base; structural shapes, 3.43c. base; plates,  $\frac{1}{4}$ -in. and heavier, 3.63c. base; No. 10 blue annealed sheets, 4.53c., and wire nails, \$3.85 per keg base.

**High Speed Steel.**—The volume of business during the past six weeks runs along on about the same weekly percentage basis. Machine shops are not buying ahead and are only placing orders for steel to fill their immediate requirements. The prices on standard brands is unchanged at \$1.70 per lb. base.

**Fluorspar.**—The demand for fluorspar is slowing down, and if more iron furnaces shut down this condition is apt to last for some time. No changes in quotations have been made and washed gravel fluorspar, at point of shipment, is quoted all the way from \$25 to \$30 per ton.

**Old Material.**—Buying is confined to relatively small amounts of scrap needed by a few foundries. The demand from the steel mills in the Pittsburgh district has fallen off. Quite a large tonnage of cast iron borings was sold in the Pittsburgh district during the past two weeks, but the buyer there is now understood to have withdrawn from the market. The demand for wrought scrap of all kinds is very light. Dealers are continuing the policy adopted several weeks ago of only taking in bargain lots of scrap. The following are dealers' buying prices in carload lots, f.o.b. yards Southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet	\$9.50 to \$10.00
Old iron rails	22.50 to 23.00
Relaying rails, 50 lb. and up	40.00 to 41.00
Rerolling steel rails	14.00 to 14.50
Heavy melting steel	13.00 to 13.50
Steel rails for melting	13.00 to 13.50
Old carwheels	15.50 to 16.00
No. 1 railroad wrought	14.00 to 14.50
Per Net Ton	
Cast borings	\$5.50 to \$6.00
Steel turnings	5.25 to 5.50
Railroad cast	15.50 to 16.00
No. 1 machinery	17.00 to 17.50
Burnt scrap	11.00 to 11.50
Iron axles	23.00 to 23.50
Locomotive tires (smooth inside)	14.00 to 14.50
Pipes and flues	10.50 to 11.00
Malleable cast	11.00 to 11.50
Railroad tank and sheet	8.50 to 9.00

## St. Louis

ST. LOUIS, May 5.

**Pig Iron.**—The pig iron market is dull, as during the past several weeks, with furnace representatives awaiting the turn of the tide, which they assert will not come until the Railroad Administration matter is settled one way or the other, and they express the fear that the readjustment of the situation may be so long deferred as to cause serious damage in a situation which might otherwise have been well cleared up by this time.

**Coke.**—No buying has been done in coke, either metallurgical or domestic, and business is at a standstill, there to remain probably until the end of the contract year, June 30.

**Finished Iron and Steel.**—Finished products show no special features apart from those already reported. There is some disposition to buy small lots for immediate or early use and a slight disposition to inquire as to deferred deliveries, but there is no inclination to buy except for actual needs until the situation clears. This applies to mill orders and to warehouse business alike. We quote for stock out of warehouse as follows:

Soft steel bars, 3.44c.; iron bars, 3.44c.; structural material, 3.54c.; tank plates, 3.74c.; No. 8 blue annealed sheets, 4.59c.; No. 10 blue annealed sheets, 4.64c.; No. 28 black sheets, cold rolled, one pass, 5.44c.; No. 28 galvanized sheets, black sheet gage, 6.79c.

**Old Material.**—No business at all is being done in the scrap market and the quotations are softening daily with no buyers appearing to give any interest or feature to the situation. There is no demand for any class of material and none of the mills or foundries is showing any disposition to buy or to make inquiries as to possibilities. Dealers generally are loaded up and therefore are not inclined to make purchases to lay down in their yards. In fact the scrap men are afraid to move in either direction—either buy or sell. The Missouri Pacific has offered during the week about 500 tons locally, the Terminal Association about 1500 tons, the Wabash about 400 tons of carwheels and the Cotton Belt about 150 tons of miscellaneous scrap. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	\$21.50 to \$22.00
Old steel rails, rerolling	16.00 to 16.25
Old steel rails, less than 3 ft.	15.50 to 16.00
Relaying rails, standard sections, subject to inspection	40.00 to 45.00
Old carwheels	20.00 to 20.50
No. 1 railroad heavy melting steel	14.00 to 14.50
Heavy shoveling steel	12.00 to 12.50
Ordinary shoveling steel	12.50 to 12.00
Frogs, switches and guards, cut apart	14.00 to 14.50
Ordinary bundled sheets, scrap	8.00 to 8.50
Heavy axle and tire turnings	8.50 to 9.00
Per Net Ton	
Iron angle bars	\$15.00 to \$15.50
Steel angle bars	13.00 to 13.50
Iron car axles	26.00 to 26.50
Steel car axles	21.50 to 22.00
Wrought arch bars and transoms	19.00 to 19.50
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	13.25 to 13.75
Railroad springs	13.50 to 14.00
Steel couplers and knuckles	14.00 to 14.50
Locomotive tires, 42 in. and over, smooth inside	14.00 to 14.50
No. 1 dealers' forge	11.50 to 12.00
Cast iron borings	7.00 to 7.50
No. 1 busheling	13.00 to 13.50
No. 1 boiler cut to sheets and rings	10.50 to 11.00
No. 1 railroad cast	19.00 to 19.50
Stove plate and light cast	14.25 to 14.75
Railroad malleable	12.50 to 13.00
Pipes and flues	11.00 to 11.50
Heavy railroad sheet and tank	10.00 to 10.50
Railroad grate bars	12.00 to 12.50
Machine shop turnings	6.50 to 7.00
Country mixed	11.00 to 11.50
Uncut railroad mixed	12.00 to 12.50
Horseshoes	14.50 to 15.00

## Dominion Iron and Steel Co. By-Product Coke Plant

The Dominion Iron & Steel Co. of Canada has recently completed and put in operation at Sydney, N. S. its third by-product coke plant. The first installation of by-product coke ovens at this plant was ovens of the Otto type, the second was ovens of the United Otto type, while the plant just completed consists of 120 Koppers ovens in two batteries of 60 ovens each, built by the Koppers Co., Pittsburgh. The first of these plants is likely to be torn down, while extensive repairs are being made to the second plant. The new Koppers by-product coke plant is located near the steel plant and receives its coal supply through a coal washer system, which was operated in connection with the first and second plants. This coal washer system has been rebuilt and will have a capacity of 2500 tons of coal a day. The incoming coal is received by rail from the mines of the Dominion Coal Co. and is passed through the washer system, and thence through the coke plant. In the new Koppers plant the usual system of by-product recovery is observed. Surplus gas produced from this plant is boosted to the mills as fuel for the soaking pit furnaces, the heating furnaces and the boilers. The tar is piped to the nearby tar distilling plant of the Dominion Tar & Chemical Co. The ammonia recovery is in the form of ammonium sulphate, which is sold in the open market. Benzols are recovered in the new plant as light oil and are worked up in the nearby benzol refining plant. The present output of benzols is mainly for motor fuel. The new plant is very complete in every way and gives the Dominion Iron & Steel Co. a modern by-product coke plant.

## IRON AND INDUSTRIAL STOCKS

## Slight Reaction in Steel Shares—Copper Stocks Quiet—Heavy Volume of Trading

NEW YORK, May 6.

The market continues its pronounced activity, with the volume of sales well over one million each day. A slight reaction took place on Wednesday, April 30, after the announcement of the discontinuance of an extra dividend on Steel common, but since then the steel shares have been uniformly firm with the leading stock close to \$99 per share. Copper shares have fluctuated but little, and the turnover has been small. The buying and selling of the market in general has been largely in oil, motor, tobacco shares and some specialties. The railroad stocks, particularly the lower priced ones, have moved up several points.

The market was closed to-day because of the parade of the 77th Division.

The range of prices in active iron and industrial stocks from Tuesday of last week to Tuesday of this week was as follows:

Allegheny-Chalm. com. 37 3/4 - 42 3/4	Int. Har. com. 130 - 133 3/4
Allegheny-Chalm. pf. 93 - 94 1/2	Int. Har. pf. 115 1/2 - 116 1/2
Am. Can. com. 53 3/4 - 56 3/4	Lackaw. Steel. 70 - 71 1/2
Am. Can. pf. 102 3/4 - 103 1/4	Lake Supr. Corp. 19 1/4 - 20 1/4
Am. Car & F. c. 93 3/4 - 96 1/4	Lima Loco. 47 - 50
Am. Car & F. pf. 116 1/4 - 118 3/4	Midvale Steel. 44 3/4 - 46
Am. Loco. com. 74 1/4 - 77 3/4	Nat.-Acme. 36 1/4 - 37 1/4
Am. Loco. pf. 104 1/2 - 105	Nat. En. & Stm. c. 59 3/4 - 63
Am. Radiator c. 275	N. Y. Air Brake. 109 - 114 1/2
Am. Ship com. 116 - 118	Nova Scotia Steel. 61 1/4 - 65
Am. Ship pf. 86	Pittsburg. Steel pf. 98
Am. Steel Fdries. 99 1/4 - 109 1/4	Pressed Steel c. 73 1/4 - 78 1/4
Bald. Loco. com. 90 1/4 - 93 3/4	Pressed Steel pf. 101
Bald. Loco. pf. 105	Ry. Steel Spg. c. 86 1/2 - 88
Beth. Steel com. 72 1/4 - 73	Ry. Steel Spg. pf. 108
Beth. Steel cl. B. 71 3/4 - 74 3/4	Republic com. 80 - 83 1/2
Case, J. I. pf. 97 - 99	Republic pf. 103 3/4 - 104
Central Fdry. c. 21 - 26	Sloss com. 51 1/4 - 55
Central Fdry. pf. 30 1/2 - 40 1/2	Superior Steel. 37 3/4 - 39
Chic. Ineu. Tool. 65 - 68	Transue-Williams 45 1/2 - 47 3/4
Coso. Fuel. 41 1/4 - 46	Un. Alloy Steel. 45 - 46 1/2
Crucible Steel c. 69 1/4 - 72 1/4	U. S. Pine com. 24 1/2 - 26 1/2
Crucible Steel pf. 94 3/4 - 95	U. S. Pipe pf. 62 - 64
Duere & Co. pf. 98	U. S. Steel com. 97 1/4 - 99 3/4
Gen. Electric. 160 - 164 1/2	U. S. Steel pf. 115 1/2 - 116 1/2
Gr. No. Ore Cert. 42 1/4 - 46 1/4	Va. I. C. & Coke. 60
Gulf States Steel. 53 1/2 - 54 3/4	Westingh. Elec. 50 3/4 - 57

## Dividends

The American Radiator Co., quarterly, 3 per cent on the common, payable June 30 and 1 3/4 per cent on the preferred, payable May 15.

The Colorado Fuel & Iron Co., 3/4 per cent on the common and 2 per cent on the preferred, payable May 15.

The Eastern Steel Co., quarterly, 2 1/2 per cent on the common, payable July 15 and 1 3/4 per cent on the first and second preferred, payable June 16.

The Pittsburgh Steel Co., quarterly, 1 3/4 per cent on the preferred, payable June 1.

The Savage Arms Corporation, quarterly, 1 1/2 per cent on the common, 1 3/4 per cent on the first preferred and 1 1/2 per cent on the second preferred, payable June 15.

The Standard Sanitary Mfg. Co., quarterly, 2 per cent on the common and 1 3/4 per cent on the preferred, payable May 10.

The American Electric Steel Co., with a capital of \$125,000, has been formed at York, Pa., and has been incorporated in York county courts. Plans provide for the immediate erection of a plant which is expected to be in operation by Sept. 1. The company will make steel castings and ingots. A special line from the electric power plant at York Haven, Pa., will supply the new plant with electricity. William Bangser, of Bethlehem, Pa., formerly a superintendent of the Bethlehem Steel Co. plant in that city, is the president and general manager of the new corporation, and Max Silberman, of Lebanon, Pa., is the treasurer.

According to the annual report of Ingersoll-Rand Co. for 1918, surplus, after charges and Federal taxes, amounted to \$3,657,172, equivalent after preferred dividends to \$30.69 a share earned on the \$10,900,035 common stock, as compared with surplus of \$5,189,785, or \$46.21 a share the year before.

## Testing Materials Meeting

At the annual meeting of the American Society for Testing Materials, to be held at the Hotel Traymore, Atlantic City, N. J., June 24-27, inclusive, special attention is to be paid to magnetic analysis and there will be a memorial session in honor of Dr. Edgar Marburg, who was secretary-treasurer from 1902 until his death on June 27, 1918. The memorial session will be held on Tuesday evening, June 24, at which also President Guiliam H. Clamer, Ajax Metal Co., will deliver an address on "Standardization." A steel and wrought iron session will be held on Wednesday morning and the subject of corrosion will be included in the magnetic analysis session on Wednesday evening. A session on malleable iron and non-ferrous metal is scheduled for Thursday evening.

Besides committee reports papers are to be read at the steel and iron session as follows: "Deep Etching of Rails and Forgings," by K. E. Hofmann and F. M. Waring, engineer of tests, Pennsylvania Railroad, Altoona, Pa.; "Modern High Speed Steel," by Dr. J. A. Mathews, president Halcomb Steel Co., Syracuse, N. Y.; "Some Fatigue Tests of Nickel Steel and Chrome Nickel Steel," by Prof. Herbert F. Moore, University of Illinois, Urbana, Ill., and A. G. Gehrig.

At the Wednesday evening session D. M. Buck, metallurgical engineer American Sheet & Tin Plate Co., Pittsburgh, will present a paper on "The Influence of Very Low Percentages of Copper in Retarding the Corrosion of Steel." On the subject of magnetic analysis, which is to follow, the speakers announced are: Dr. Charles W. Burrows, New York; Frank P. Fahey, New York; R. L. Sanford and M. F. Fischer, Bureau of Standards; Prof. W. B. Kauwenhoven, Johns Hopkins University, Baltimore; Dr. P. H. Dudley, New York, and C. Nusbaum.

Harry A. Schwartz, chemist, National Malleable Castings Co., Indianapolis, is to present a paper, entitled "Some Physical Constants of Malleable Cast Iron," at the malleable session.

## Nominations for Officers

The following nominations for officers are announced:

For president, J. A. Capp, chief testing laboratory, General Electric Co., Schenectady.

For vice-president, C. D. Young, superintendent motive power, Philadelphia, Baltimore & Washington Railroad, Wilmington, Del.

For members of executive committee, Ernest Ashton, H. F. Moore, C. F. W. Rys and Admiral D. W. Taylor.

The total membership reported at the last annual meeting was 2261. The total membership on April 18 was 2376, making a net increase of 115 as compared with an average net increase of 58 for the corresponding period for the previous five years.

## British Steel and American Competition

British manufacturers of steel products are much concerned over the possibility that they will be unable to meet competition of American manufacturers in the markets of the world. This is the opinion of A. J. Lockwood of Edgar T. Ward's Sons Co., New York, steel jobber, who returned last week from England. Mr. Lockwood was born in the Sheffield district of England and learned the steel trade there. Prior to the war he made a yearly visit to England, and therefore has kept fully in touch with the British steel industry for several decades. High cost of coal and demands of labor are important factors in the greatly increased production costs which British steel manufacturers now face. One of the great problems of reconstruction in England is to provide better housing conditions for working men. In the Sheffield district there are sections, Mr. Lockwood says, where people have scarcely room to turn around, yet not many miles away are estates of the nobility containing hundreds of thousands of acres. Many of these estates will be broken up into small farms and put under cultivation. A step has already been taken in this direction by some of the English titled land owners.

# Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, \$1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is \$1.315, minimum carload 40,000 lb.; and \$1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c.; minimum carload 46,000 lb.; Denver, 99c.; minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs:

## Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zeels, structural sizes, 2.45c.

## Wire Products

Wire nails, \$3.25 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of \$1.50, and shorter than 1 in., \$2.00. Bright basic wire, \$3.15 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.00; galvanized wire, \$3.70; galvanized barbed wire and fence staples, \$4.10; painted barbed wire, \$3.40; polished fence staples, \$3.40; cement-coated nails, \$2.85 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60½ per cent off list for carload lots, 59½ per cent for 1000-rod lots, and 58½ per cent off for small lots, f.o.b. Pittsburgh.

## Bolts, Nuts and Rivets

Large structural and ship rivets.....\$3.70 base  
Large boiler rivets.....\$3.80  
¼ in., 5/16 in. and 7/16 in. diam., .65-10 and 5 per cent off list  
Machine bolts, h.p. nuts, ¾ in. x 4 in.:  
Smaller and shorter, rolled threads, .60-10-5 per cent off list  
Cut threads......60-5 per cent off list  
Larger and longer sizes......50-10 per cent off list  
Machine bolts, c.p.c. and t. nuts, ¾ in. x 4 in.:  
Smaller and shorter......45-10-10 per cent off list  
Larger and longer......40-10-5 per cent off list  
Carriage bolts, ¾ x 6 in.:  
Smaller and shorter, rolled threads......60-5 per cent off list  
Cut threads......50-10-5 per cent off list  
Larger and longer sizes......45-10 per cent off list  
Lag bolts......65-5 per cent off list  
Plow bolts, Nos. 1, 2, 3......60 per cent off list  
Hot pressed nuts, sq. blank......3.25c. per lb. off list  
Hot pressed nuts, hex., blank......3.25c. per lb. off list  
Hot pressed nuts, sq. tapped......3c. per lb. off list  
Hot pressed nuts, hex., tapped......3c. per lb. off list  
C.p.c. and t. sq. and hex. nuts, blank......3.25c. per lb. off list  
C.p.c. and t. sq. and hex. nuts, tapped......3c. per lb. off list  
Semi-finished hex. nuts:  
¾ in. and larger......70-10 per cent off list  
½ in. and smaller......80 per cent off list  
Stove bolts, in packages......70-10-10-5 per cent off list  
Stove bolts......2½ per cent extra for bulk  
Tire bolts......60-10-10-5 per cent off list  
The above discounts are from March 28, 1919.  
All prices carry standard extras. Pittsburgh basis.

## Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$52; chain rods, \$60; screw, rivet and bolt rods and other rods of that character, \$60. Prices on high carbon rods are irregular. They range from \$65 to \$75, depending on carbons.

## Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. x 4½ in. and heavier, and small spikes, per 100 lb., \$3.35 in lots of 200 kegs of 200 lb. each or more; track bolts, \$4.35 per 100 lb. in car load lots of 200 kegs, or more, and \$4.90 in small lots. Boat and barge spikes, \$3.85 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh.

## Terne Plate

Prices of terne plate are as follows: 8-lb. coating, 200 lb., \$13.80 per package; 8-lb. coating, I. C., \$14.10; 12-lb. coating, I. C., \$15.80; 15-lb. coating, I. C., \$16.80; 20-lb. coating, I. C., \$18.05; 25-lb. coating, I. C., \$19.30; 30-lb. coating, I. C., \$20.30; 35-lb. coating, I. C., \$21.30; 40-lb. coating, I. C., \$22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

## Iron and Steel Bars

Steel bars at 2.35c. from mill. Prices on bar iron are 2.25c.

## Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card.

Steel				Iron			
Inches	Black	Galv.		Inches	Black	Galv.	
1½, 1¼ and ¾	50½	24		1½ and 1¼	29½	24	
1½	54½	40		¾	30½	24	
¾ to 3	57½	44		¾ to 1½	31½	24	
2	50½	38		1½	24½	9½	
2½ to 6	53½	41		1½	31½	17½	
7 to 12	50½	37		2	32½	18½	
13 and 14	41			2½ to 6	34½	21½	
15	38½			7 to 12	31½	18½	
Butt Weld, extra strong, plain ends							
1½, 1¼ and ¾	46½	29		¾, ¾ and ¾	28½	11½	
1½	51½	39		¾	33½	20½	
¾ to 1½	55½	43		¾ to 1½	39½	24½	
2 to 3	56½	44					
Lap Weld, extra strong, plain ends							
2	48½	37		1½	25½	10½	
2½ to 4	51½	40		1½	31½	17½	
4½ to 6	50½	39		2	33½	20½	
7 to 8	46½	33		2½ to 4	35½	23½	
9 to 12	41½	28		4½ to 6	34½	22½	
				7 to 8	26½	11½	
				9 to 12	21½	9½	

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

## Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel	Charcoal Iron
3½ to 4½ in..... 40½	3½ to 4½ in..... —16
2½ to 3½ in..... 30½	3 to 3½ in..... —1½
2½ in..... 24	2½ to 2¾ in..... +1
1¾ to 2 in..... 19½	2 to 2½ in..... +10
	1¾ to 1½ in..... +20

## Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton	Per Net Ton
1 in..... \$327	1¾ in..... \$207
1¼ in..... 267	2 to 2½ in..... 177
1½ in..... 257	2½ to 3¾ in..... 167
1½ in..... 207	4 in..... 187
	4½ to 5 in..... 207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

## Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

Blue Annealed—Bessemer	Cents per lb.
No. 8 and heavier.....	3.50
Nos. 9 and 10 (base).....	3.55
Nos. 11 and 12.....	3.60
Nos. 13 and 14.....	3.65
Nos. 15 and 16.....	3.75
Hot Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21.....	4.15
Nos. 22 to 24.....	4.20
Nos. 25 and 26.....	4.25
No. 27.....	4.30
No. 28 (base).....	4.35
No. 29.....	4.40
No. 30.....	4.50

Galvanized, Black Sheet Gage—Bessemer	
Nos. 10 and 11.....	4.70
Nos. 12 and 14.....	4.80
Nos. 15 and 16.....	4.95
Nos. 17 to 21.....	5.10
Nos. 22 to 24.....	5.25
Nos. 25 and 26.....	5.40
No. 27.....	5.55
No. 28 (base).....	5.70
No. 29.....	5.95
No. 30.....	6.20

Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16.....	4.15
Nos. 17 to 21.....	4.30
Nos. 22 to 24.....	4.25
Nos. 25 to 27.....	4.30
No. 28 (base).....	4.35
No. 29.....	4.40
No. 30.....	4.40
Nos. 30½ and 31.....	4.45

## Non-Ferrous Metals

### The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin, New York	Lead		Spelter	
	Lake	Electro- lytic		New York	St. Louis	New York	St. Louis
Apr 30	15.50	15.25	72.50	4.85	4.60	6.37½	6.02½
May 1	15.50	15.25	72.50	4.80	4.60	6.35	6.00
May 2	15.50	15.25	72.50	4.77½	4.60	6.35	6.00
May 3	15.50	15.25	72.50	4.80	4.60	6.35	6.00
May 4	15.50	15.25	72.50	4.85	4.60	6.27½	5.92½
May 5	15.50	15.25	72.50	4.85	4.60	6.27½	5.92½

NEW YORK, May 6.

The markets continue inactive and featureless. Copper demand is light with prices virtually pegged. There is no tin market possible. Lead has changed hands at lower levels. The spelter market is weaker with some selling to speculators. Antimony is firm. A military holiday practically exists in New York to-day.

### New York

**Copper.**—Demand continues almost negligible and prices are unchanged from last week. Quotations are generally regarded as pegged at present levels with producers unwilling to force the market and with consumers disinclined to enter it. Very little change in demand is expected until the middle of May, most consumers being covered until then. Electrolytic copper is nominal at 15.25c., New York, for early delivery with Lake copper 15.50c., New York. The statement is made that at least 1,500,000,000 lb. of copper is above ground with 600,000,000 lb. considered a normal amount. A decided reduction in production is regarded as imperative.

**Copper Averages.**—The average price of Lake copper in April, based on daily quotations in THE IRON AGE, was 15.55c. The average price of electrolytic was 15.30c.

**Tin.**—There have been no developments in this market which is still under Government control. The price of the allocated metal remains unchanged at 72.50c., New York, and American tin is unobtainable, with producers reported unwilling to quote for delivery the market is free. A rumor is going the rounds that the stocks of allocated metal have been reduced to about 1500 to 2000 tons, but this could not be substantiated. There have been no offerings in the last week for shipment from the Far East after restrictions are removed and buyers have showed very little interest in this position in the last few days. For the first time in many months, or perhaps years, there were no tin arrivals in this country for the month of April. Yesterday the London quotation was £227 10s. per ton for spot Straits.

**Lead.**—The New York market has been soft in the last week, and prices fell off to 4.77½c. last Friday, since which time they have been advanced slightly and the tone is a little better. As low as 4.75c., New York, is said to have been done. Some business is reported at the various levels quoted, but there is no snap to the market. The outside market is quoted to-day at 4.60c., St. Louis, or 4.85c., New York, for early delivery. The American Smelting & Refining Co. still holds its quotation at 5c., New York, or 4.70c., St. Louis. It is believed that the lower tendency of the market has been due largely to a discounting by sellers of a possible decline in the quotation of the leading interest. The general attitude of buyers is that, while lead is regarded as very reasonable, they would prefer to keep the money in the banks rather than purchase the metal.

**Spelter.**—The market continues to be bare of orders from consumers and prices have sagged in the last week. Dealers have been buyers at 5.92½c., St. Louis, or 6.27½c., New York, at which level a fair business has been done. We quote the market for prime Western for early delivery at these levels. It was thought that

when 6c., St. Louis, had been reached that consumers would enter the market, but they may now wait until 5.75c., St. Louis, is the level, which is not regarded as unlikely.

**Antimony.**—Wholesale lots for early delivery are unchanged at 6.62½c. to 6.87½c., New York, duty paid, for Asiatic grades.

**Aluminum.**—No. 1 virgin metal, 98 to 99 per cent pure, is slightly higher at 31c. to 33c., New York, for early delivery, with demand light.

**Old Metals.**—The market is very dull and transactions are few. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	15.00
Copper, heavy and wire	14.00
Copper, light and bottoms	12.25
Brass, heavy	11.25
Brass, light	7.50
Heavy machine composition	15.00
No. 1 yellow rod brass turnings	8.25
No. 1 red brass or composition turnings	12.50
Lead, heavy	4.50
Lead, tea	3.75
Zinc	5.00

### St. Louis

ST. LOUIS, May 5.—Non-ferrous markets have been quiet and easy with quotations to-day for car lots as follows: Lead, 4.62½c.; spelter, 6c. to 6.07½c. In less than car lots the quotations were to-day: Lead, 4.87½c. to 5c.; spelter, 6.50c.; tin, 72.50c.; copper, 16c. to 17c.; Asiatic antimony, 8.50c. In the Joplin district ore prices have been weaker and lower with the top price for zinc blende, basis 60 per cent, about \$37 per ton, while the range was downward as low as \$32.50 for second grades, with some reported sold even lower. Calamine, basis 40 per cent, ranged from \$25 to \$27 per ton, while lead ore sold, basis 80 per cent, at \$55 per ton. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 6.50c.; heavy yellow brass, 8.50c.; heavy red brass, 13c.; heavy copper and copper wire, 13c.; light copper, 10c.; pewter, 35c.; tinfoil, 40c.; lead, 4c.; tea lead, 3c.; zinc, 3c.; aluminum, 18c.

### Chicago

CHICAGO, May 5.—Copper and tin are quiet, with quotations unchanged. Lead and spelter have weakened slightly. Antimony has been unsteady, having fallen a quarter of a cent and later regained that amount. In general the market has been dull. Old metal prices remain firm except for an advance of 3c. in pewter. We quote copper at 16c. to 16.50c. for carloads; tin, 72.50c.; lead, 4.70c. to 4.77½c.; spelter, 6.10c. to 6.20c.; antimony, 8.25c. to 8.75c. On old metals we quote copper wire, crucible shapes, 13c.; copper clips, 12.50c.; copper bottoms, 11c.; red brass, 13c.; yellow brass, 8c.; lead pipe, 3.50c.; zinc, 4c.; pewter, No. 1, 35c. tinfoil, 37c. and block tin, 50c., all these being buying prices for less than carload lots.

### Cincinnati

CINCINNATI, May 5.—The market is very dull and prices are generally unchanged. Lead manages to hold its own at 4c. a lb. and heavy copper scrap remains at 13c. to 13.50c., and crucible copper at 13.50c. to 14c. Copper wire, 13.50c. to 14c.; heavy red brass, 13c. to 13.50c., and yellow brass, 8c. to 8.50c. Block tin pipe, which is in fair demand locally is bringing all the way from 57c. to 59c. a lb.

On Monday, May 5, the new two-high, 34-in. blooming mill, built by Mackintosh-Hemphill Co., Pittsburgh, for the Sharon Steel Hoop Co., was put in operation at the latter's plant at Lowellville, Ohio. This mill replaces one installed some years ago when the Lowellville plant was first built, and will give the company a much larger output of semi-finished steel for its plate and sheet bar mills. The sheet bars will be used in the sheet mills of the Sharon Steel Hoop Co. at Haselton, where it has mills making sheets and pressed steel specialties.

## PERSONAL

Charles M. Haskins, secretary National Association of Waste Material Dealers, with headquarters in the Times Building, Times Square, New York, has severed his connection with the *Commercial Bulletin*, Boston, in order that he may devote more time to the association.

The Packard Electric Co., Warren, Ohio, has opened a New York office at 141 West Thirty-sixth Street, Room 501, Herald Square Building, with Capt. J. Ed. Erickson as district manager. Prior to Mr. Erickson's entrance into the United States Army, he was one of the direct representatives of the Packard company, traveling from the Warren office. When the war broke out he was called to Washington to take entire charge of the transformer division for the United States Government. The Packard company expects to extend its activities in the East.

J. A. Disney, formerly district manager Canadian branch, Atlas Crucible Steel Co., at Montreal and Quebec, has opened branch offices at 624 Lindsey building, Dayton, Ohio. Mr. Disney now represents the Atlas Crucible Steel Co., as district manager in southern Ohio territory.

Coates, Bennett & Reidenbach, Inc., Rochester, N. Y., scrap metal dealers, announce that F. W. Reidenbach has been released from duty by the salvage department of the United States Army and has resumed his duties as vice-president of the company.

At the annual meeting of stockholders of the General Motors Corporation, May 1, W. P. Chrysler was elected first vice-president and H. H. Bassett was made director and member of the executive committee and general manager of the Buick division. F. W. Hohensee, general manager Chevrolet division, was elected vice-president of General Motors.

Charles F. Colbert, Jr., for the past eight years sales manager and assistant general manager for the W. Harry Brown coal and coking interests of Pittsburgh, became associated, effective May 1, with the Pioneer Coal & Coke Co., Henry W. Oliver Building, Pittsburgh, as general manager. Mr. Colbert's change in work follows W. Harry Brown's sale of his Alicia properties to the Pittsburgh Steel Co., about two months ago.

Harry F. Coyle, of the Cromwell Steel Co., Lorain, Ohio, previously with the Illinois Steel Co., Gary, Ind., has accepted a position as production superintendent with the Central Steel Co., Massillon, Ohio.

Childs Frick, son of Henry C. Frick, has been elected a director of the Union Savings Bank, Mellon National Bank, and the Union Trust Co., all of Pittsburgh. His father has been a director of these institutions for many years.

Victor E. Karminski, general manager, and H. Lad Landau, general sales manager, Rownson, Drew & Clydesdale, Inc., and W. J. Crouch Co., Inc., 68 William Street, have both severed their connections with these merged companies. Mr. Landau has therefore given up his contemplated trip to the Far East in the interest of the companies.

Major C. E. Lester, Meadville, Pa., who had varied experience in railroad shops before the war, has been appointed general superintendent 19th grand division, Transportation Corps, A. E. F. Upon arrival in France he was appointed general foreman Nevers Locomotive Shops, operated entirely by soldiers; later assistant superintendent, then acting superintendent of the 19th grand division.

Edward V. Peters has been appointed head of the sales department of the New Jersey Zinc Co., New York, succeeding H. G. Clopper. Mr. Peters had been assistant general sales manager for the past three years.

H. H. Lotz, for many years with the Lowe Brothers Co., has become associated with the sales organization of the Hilo Varnish Corporation, Brooklyn, N. Y. Mr. Lotz will make his headquarters at Dayton and will

look after both the manufacturing and the jobbing trade in southern Ohio.

The Black & Decker Mfg Co., Baltimore, has just established a New York office at Room 2920, Equitable Building, which will be in charge of G. R. Lundane, who will supervise the distribution of Black & Decker products in New York and surrounding territory, including Connecticut. Mr. Lundane has been recently connected with the Findeisen & Kropf Mfg. Co., Chicago.

Meyer, Strong & Jones, Inc., has succeeded to the engineering practice of Henry C. Meyer, Jr., and Bassett Jones, associated, and of William E. S. Strong. Mr. Strong was connected, for many years, with the American Radiator Co., as chief engineer, designing and constructing various plants and special appliances, and is now its consulting engineer. He joined the export department of J. P. Morgan & Co. at its formation and continued as a purchaser of munitions for the Allies throughout the Morgan firm's connection with this work. Mr. Meyer and Mr. Jones have been engaged in consulting work in New York since 1903, specializing in the mechanical, electrical and power equipments of buildings and industrial plants. C. A. King, H. E. Meeker, H. F. Richardson and J. J. Ruckes, who have been associated with Messrs. Meyer and Jones for a number of years, will be in responsible charge of the work in the new organization. The new firm will have offices at 101 Park Avenue, New York.

Warren W. Baker, president Pennsylvania Steel Export Co., Widener Building, Philadelphia, who returned recently from a trip to Europe, will leave May 29 for Japan and China, accompanied by his two daughters. Mr. Baker will be gone three months and expects to make new connections for his company in the Far East.

W. F. Rockwell, vice-president in charge of engineering and manufacturing with the Torbensen Axle Co., has resigned, effective May 1, to become general manager of the E. B. Hayes Machinery Corporation, Oshkosh, Wis.

Col. Robert S. Abernathy has been ordered to Boston to represent the Secretary of War in preparations for testing the Hammond wireless-controlled torpedo.

A. B. Hawes has joined the sales force of Walter Wallingford & Co., pig iron and coke merchants, and will travel out of the Cincinnati office.

S. H. McKee, assistant chief engineer Republic Iron & Steel Co., Youngstown, Ohio, read a paper on "Central Boiler Feed Water Service for Plants" at the meeting of the Engineers' Society of Western Pa., held in its rooms in the Union Arcade, Pittsburgh, on Tuesday evening, May 6. The paper was illustrated with lantern slides, and described in detail the installation at Youngstown plants of the Republic Iron & Steel Co. of a boiler feed supply system to supply several plants from a central water station, the station combining intake and pumping equipment delivering to a water sampling system, purified water basin and distributing pump.

Howard K. Stokes, Plainfield, N. J., has succeeded Prescott Warren, Boston, as president of the Bell Locomotive Works, Inc., 11 Pine Street, New York, manufacturer of industrial locomotives.

J. P. Brennen will retire shortly as president of the Thompson Connellsville Coke Co., but will remain president of the Producers' Coke Co., selling agency for a number of independent operations. He is rounding out his fortieth year as an operator.

W. L. Curry has been elected chairman of the National Fire Proofing Co., Pittsburgh, succeeding J. D. Finley, deceased, and H. M. Keasbey, New York, has been elected president, succeeding the late W. D. Henry.

George N. Jeppson, works manager Norton Co., Worcester, Mass., has been nominated by Governor Calvin Coolidge a member of the State Commission on Foreign and Domestic Commerce.

Duncan G. Sinclair, formerly chief assistant engineer of the Pittsburgh Railways Co., and the Duquesne

Leach Co., Pittsburgh, has been appointed manager of the New York office of the Pittsburgh Piping & Equipment Co., Pittsburgh, with headquarters in the St. Paul Building, 220 Broadway, New York.

Capt. Ben Sloan, who has served in the Ordnance Department, U. S. A., since 1917, has been released and has reassumed his work in the sales department of the Pratt & Whitney Co.'s New York office.

J. A. Doyle, formerly auditor of works of the Jones & Laughlin Steel Co., Pittsburgh, has been made auditor, effective May 1. Mr. Doyle succeeds W. A. Early, who died at Atlantic City, N. J., April 22, only a short time after he had been appointed auditor. Mr. Doyle has been connected with the Jones & Laughlin Steel Co. for many years in various capacities.

The Omaha chapter of the American Association of Engineers has elected W. R. McKeen, president McKeen Motor Car Co., president for the ensuing year.

J. Douglas Genger, general superintendent of the Reading Steel Casting Co., Reading, Pa., has resigned to go on May 10 to Mexico City, Mexico, where he will assume a similar position with an American owned concern.

H. M. L. Hunter, formerly of Pittsburgh, has joined the sales force of the Jones & Laughlin Steel Co., and will travel from its Cincinnati office.

Alfred Crook is spending a few months in Europe investigating the foreign steel trade situation in the interest of the Philadelphia Roll & Machine Co. and of the Tioga Steel & Iron Co., Philadelphia, of which concerns he is vice-president and general manager.

L. S. Thomson, for five years with the La Belle Iron Works, Steubenville, Ohio, has become connected with the structural sales division of the Midvale Steel & Ordnance Co. at its general offices in Philadelphia.

## OBITUARY

W. W. PAGE, president National Wire Wheel Works and secretary Geneva Cutlery Corporation, Geneva, N. Y., died suddenly at Geneva April 29 of pleural pneumonia. He was 38 years old, and was also president of the Goodwin Press and one of the owners of W. Reed Williams, Inc., a large export company.

MILTON O. SHECKLER, for some years superintendent of the foundries of the Union Switch & Signal Co., Swissvale, Pittsburgh, died at his home in Wilkesburg, Pa., on April 27. He had been connected in various capacities with Union Switch & Signal Co. for over 25 years.

EDWARD F. GRAY, a department manager of the Standard Sanitary Mfg. Co., Pittsburgh, died at his home in Thornburg, a suburb of that city, on Saturday, April 24. He had been an employee of this company for about 30 years, and started his career with it as a clerk.

HENRY M. NORTON, president Norton Electrical Co., Manchester, Conn., died April 30 of pneumonia. He was born in Manchester, 1876, and was associated with his brothers in the manufacture of electrical instruments.

PAUL P. TIROHN, president and treasurer of the Perfection Automatic Machine Co., Cleveland, died May 4 after a short illness of acute indigestion, aged 41 years.

S. WITWER, president Joliet Mfg. Co., manufacturer of agricultural implements, Joliet, Ill., died in that city on April 15. His death was due to a sudden attack of heart trouble.

CHARLES H. EATON, president Kalamazoo Spring & Axle Co., Kalamazoo, Mich., died last week at the age of 78 years.

## First Convention and Exhibition of Steel Treaters' Society

The first national convention of the American Steel Treaters' Society will be held in the seventh regiment armory, Wentworth Avenue and Thirty-fourth Street, Chicago, in the week of Sept. 22. The program committee is in charge of B. J. Janitzky, metallurgical engineer Illinois Steel Co. In the same week, and in the same building, the society will hold an exhibit of heat treating appliances and heat treated products. The best exposition building in Chicago, with 26,000 sq. ft. of floor space and desirable adjuncts, has been contracted for. The service of a competent exposition company has been engaged to equip, decorate and arrange the exposition. The society has issued a diagram of the floor space, and the arrangements for the convention are under the direction of L. J. Murphy, chairman of the exhibit committee, American Steel Treaters' Society, 154 East Erie Street, Chicago.

### Steel Treaters' Chapter in Cincinnati

The society has organized a chapter in Cincinnati. This chapter was organized on Friday evening, April 18, when over 90 representatives of the leading industries in Cincinnati gathered in the Business Men's Club. W. S. Spear, metallurgist, Cincinnati Milling Machine Co., was elected chairman, and J. M. Manley, secretary National Metal Trades Association, was elected secretary-treasurer.

The Philadelphia chapter of the society held its first monthly meeting on Friday evening, April 25, in the lecture room of the Engineers' Club, Philadelphia. The program included: L. R. Seidell, chief metallurgist Wright-Martin Aircraft Corporation, Long Island City, on "Effects of Heat Treatment on Physical Properties and Micro-Structure of Stainless Steel"; A. H. D'Arcambal, chief metallurgist, Wright-Martin Aircraft Corporation, New Brunswick, N. J., on "Aluminum Pistons for Aviation Motors"; D. K. Bullens, Cann & Saul Co., Royersford, Pa., on "Heat Treatment of Chromium Steels," and A. J. Craddock, assistant metallurgist, E. F. Houghton & Co., on "Quenching Oils and Their Relative Quenching Speed."

The addresses will be published in the May issue of the *Journal of the American Steel Treaters' Society*.

### Program of American Iron and Steel Institute

At the fifteenth general meeting of the American Iron and Steel Institute to be held at Hotel Pennsylvania, New York, May 23, the opening address will be delivered as usual by the president of the institute, Judge Elbert H. Gary, after which the following papers will be read:

THE LABORATORIES OF THE BUREAU OF STANDARDS, WASHINGTON, S. W. Stratton, Director, and G. K. Burgess, Chief of Metallurgical Division.

ELECTRICALLY-HEATED SOAKING PITS AND HEATING FURNACES, T. F. Baily, president the Electric Furnace Co., Alliance, Ohio.

THE AMERICAN BRIDGE CO.'S FORGE PLANT AT GARY, IND., C. J. Walker, manager, Forge Plant, American Bridge Co., Gary, Ind.

THE BY-PRODUCT COKE PLANT AT CLAIRTON, PA., P. F. Marquard, superintendent, By-Product Coke Plant, Carnegie Steel Co., Clairton, Pa.

STANDARDIZATION OF SHIPBUILDING MATERIALS, P. T. Llewellyn, Federal Shipbuilding Co., Kearny, N. J., Chickasaw Shipbuilding Co., Mobile, Ala.

PRESENT STATUS OF NON-METALLIC IMPURITIES (SONIMS) IN STEEL, Henry D. Hibbard, Plainfield, N. J.

NOTES ON OPEN-HEARTH PRACTICE, H. M. Howe, professor emeritus, Columbia University, Bedford Hills, N. Y.

METHODS OF CHARGING RAW MATERIALS INTO THE BLAST FURNACE, J. A. Mohr, superintendent, Carrie Blast Furnaces, Carnegie Steel Co., Rankin, Pa.

At the noon recess members will be guests of the institute at a buffet lunch and in the evening there will be a banquet.

At the annual business meeting of the Institute, held Monday, May 5, the following officers were re-elected: President, Elbert H. Gary; vice-presidents, Willis L. King, Charles M. Schwab, John A. Topping; treasurer, Edward Bailey; secretary, James T. McCleary.

## New Plant of Detroit Seamless Steel Tubes Co.

The Detroit Seamless Steel Tubes Co., has begun construction of a \$3,000,000 plant on a 60-acre tract on Warren Avenue, opposite the Morrow Aviation Field, Detroit. The first section, costing \$1,000,000 will be completed by Jan. 1. The company will move from its present location at West Jefferson and Nineteenth Streets, which has been sold to the Pennsylvania Railroad Co.

The building plans, which have been prepared by Albert Kahn, call for a structure of steel and glass with brick and concrete facing. The roof will be of tile. The plant proper will occupy a space of 350x550 ft. It will consist of three bays for manufacturing units, a separate heating plant and a 2-story administration building. The three manufacturing units will be each 90 x 550 and 45 ft. high, to permit the use of traveling cranes and other labor-saving machinery. The interior layout and special tube mill machinery was designed under the direction of C. A. Ross, consulting mechanical engineer, and C. L. Stafford, mill superintendent.

A subdivision will be created in the vicinity of the building and 150 homes erected for workmen of the company. The entire construction and the financing of these homes will be done by the company to assist its employees in their housing problems.

The total capacity of the first unit of the new plant will be 2500 tons of seamless steel tubing a month, the range of sizes being from  $\frac{1}{2}$  in. to 6 in. in diameter. This tubing is used in the manufacture of automobiles, tractors, motor trucks, locomotives and stationary boilers.

The social and recreational features for the employees have not been slighted. In the administration building there will be club rooms, reading rooms and other facilities. In the plant proper there will also be showers for the men. A fully equipped hospital will be another of the plant's features.

The Detroit Seamless Steel Tubes Co. is the original and only manufacturer of seamless steel tubing in Michigan, having been established 19 years ago at its present location. Allan A. Templeton is president of the company, also president of the Detroit Board of Commerce.

## Sale of Gelsenkirchen Property in Luxemburg

Discussion of the proposed sale of steel works of the Gelsenkirchen company in Luxemburg indicates, as reported in *L'Usine*, that the government of Luxemburg believes that the transfer of these German owned industries into neutral or allied hands is of vital interest to the country, as well as to its industry. The present proposal as described comprehends the taking over of the property of the Gelsenkirchen works in the Rhenish province, in Luxemburg, and in Lorraine, France and Belgium. It is emphasized that the new owner should be a Luxemburg company, having its headquarters in the Grand Duchy, and subject to the laws of Luxemburg. It is added that the general conditions have been accepted and that the authorities have proceeded in the formation of a group powerful enough to take all the Gelsenkirchen property to the left bank of the Rhine. This group, it is said, is composed of producers and consumers of steel and that French interests will be represented for 50 to 55 per cent, less Belgian interests for about 20 to 25 per cent and Luxemburg interests for about 25 per cent, with arrangements for public participation in this last fraction. Incidentally *L'Usine* indicates its belief that the French works interested in the project are Schneider & Co. and the Societe Anonyme des Laminoirs, Hauts-Fourneaux, Forges, Fonderies et Usines de la Providence.

In furthering the transfer the Luxemburg Government emphasizes that it has been careful to safeguard the interests of the country; that it does not overlook the fact that the mineral reserves of the country are insufficient to maintain normal production of its works; that these will in fact be exhausted in fifteen or twenty years, and that then the metallurgical industry of the

country would be dependent on Germany for its coke and on France for its ore.

The Frankfort *Gazette* indicates that the following works are subject to sale: The Adolf Emil works; the blast furnaces at Esch and at Oth; mining rights at Esch, participation in the mines of Saint-Piromont et Villerupt; the steel works and rolling mills of Rothe-Erde and the Eschweiler wire mills.

## Material Put on the Market by Italy

Italy has put on the market an amount of material in metal lines, said to total about 400,000 tons, on which prices have been fixed as follows:

	Per lb.
Common iron .....	4.55c.
Rails .....	4.85c.
Black sheets .....	5.15c.
Galvanized sheets .....	7.45c.
Welded tubes .....	7.80c.
Seamless tubes .....	9.60c.
Copper, up to 500 tons .....	18.00c.
Copper, over 500 tons .....	16.50c.
Copper sheets .....	27.00c.
Brass sheets (64 per cent copper, 32 per cent zinc) .....	27.60c.
Brass wire .....	25.20c.
Brass tubes (68 per cent copper, 32 per cent zinc) .....	27.60c.
Spelter .....	10.20c.
Lead .....	6.00c.
Antimony .....	10.50c.
Tin .....	60.00c.
Nickel .....	39.00c.
Aluminum .....	36.00c.
Sheet aluminum .....	45.00c.

## Steel Corporation Buys Land

The United States Steel Corporation, through its subsidiary, the Carnegie Steel Co., has purchased 54 acres at Kearny, N. J., on the Passaic River, for purposes which are not yet announced. The land is at present occupied by the shipbuilding plant of the Foundation Co., but this plant will be wrecked at once, the Foundation Co.'s lease of the property expiring four months from the date of the signing of the treaty of peace. The land was bought from the Ford Realty Co. at a price reported to be about \$350,000. The Steel Corporation, through its subsidiary, the Federal Shipbuilding Co., recently acquired another tract of land adjoining the Federal shipbuilding plant, which will be used for a dry dock and ship repair plant.

## Locomotive Orders

CHICAGO, May 6—(By Wire).—The Baldwin Locomotive Works has received orders for five consolidation type locomotives from the Union Railroad, Pittsburgh, and six engines from the South Manchurian Railway, China. The Baldwin company is just completing 26 locomotives previously ordered by the South Manchurian. The Kinhan Railroad, China, has ordered 10 locomotives from the Lima Locomotive Works and the Constitutionalist Railways of Mexico have sent out inquiries for 10 Mikado type engines.

Harold L. Frankle, who was for some time connected with the Joseph Joseph & Bros. Co. in the scrap iron and metal business, has organized and incorporated a company at Buffalo with a capital stock of \$50,000 for the purpose of dealing in scrap iron and steel commodities and metals and will at once establish a yard and plant. The offices of the new company will be at 1009-1010 D. S. Morgan Building. Mr. Frankle will be the vice-president and treasurer of the corporation, and S. Ginsberg, who for a number of years has been in the iron and steel business, will be the president.

A monster locomotive of a new type, known as class HCIS, is being built at the shops of the Pennsylvania Railroad at Altoona, Pa., for experimental purposes. It has a total length with tender of 105 ft., 9 $\frac{1}{4}$  in. It has eight pairs of driving wheels, each wheel having a diameter of 62 in. The fire box is 96 by 168 in. with a fire grate area of 112 sq. ft. The big machine will stand 12 ft. high. When it is ready for the tests, the locomotive will be sent East and tried out, and will then run over the mountain grades, as it was designed primarily for mountain traffic.

# Machinery Markets and News of the Works

## MORE INQUIRY IN EAST

### Machine-Tool Buying, However, Is Not Large

#### Government Tools Coming on Market in Quantity—Shipyard Wants 400 Tools

There is considerable additional inquiry for machine tools in the East, but relatively little buying. The only important buying of the past week was done by the Dubied Machinery Co., New York, which placed verbal orders for about 100 tools for shipment to its plants in Switzerland and England. Confirming orders will probably be forthcoming soon. One of the largest inquiries comes from the American International Shipbuilding Corporation, Philadelphia, which may close soon for 400 tools—100 16-in. lathes, 100 20-in. upright drills, 100 9-in. or 14-in. shapers and 100 10-in. grinders, with 100 electric motors. This equipment is for machine shops on merchant ships. The Merchant Shipbuilding Corporation, Bristol, Pa., recently inquired for 30 similar sets of tools, but has not closed. Another inquiry comes from the E. W. Bliss Co., Brooklyn, which wants about 30 large tools, including 11 planers, while the Federal Shipbuilding Co., Kearny, N. J., is about ready to ask for quotations on equipment for a dry dock and ship repair plant and will expend about \$250,000. The Navy Department is asking for bids on 12 16-in. lathes for the navy yard in Brooklyn. The Standard Oil Co. of New Jersey has issued a supplemental list of 17 tools wanted for shipment to Rumania. A former list for Rumania of about 70 tools has not yet been purchased. Orders are about to be placed, however, by this company for about 50 tools for a repair plant at Bayway, N. J.

The largest list of cranes since the ending of the war has been sent out by the Bureau of Yards and Docks, Navy Department, calling for bids by May 19 on 22 cranes from 15 tons up to 250 tons capacity for the naval ordnance plant at Charleston, W. Va.

In the Philadelphia market there are more prospects than for many weeks. The North American Motors Corporation, Pottstown, Pa., has recently bought about \$50,000 worth of tools for motor work. The Lycoming Foundry & Machine Co., Williamsport, Pa., may soon increase its equipment for making Dort motors; the

Camden Mfg. Co., Camden, N. J., the Standard Steel Co., Philadelphia, the Wright Roller Bearing Co., Philadelphia, and the Nice Ball Bearing Co., Philadelphia, have all come into the Philadelphia market for small lists of tools.

The Bureau of Aircraft Production has rejected all bids on 630 tools from the plant of the Union Switch & Signal Co., Swissvale, Pa., and is asking again for tenders for this equipment. The equipment used for shell-making at the plant of the Eddystone Munitions Co., Eddystone, Pa., consisting of several hundred tools, is on the market and the equipment of the Wright-Martin Aircraft Corporation, Long Island City, N. Y., about 1000 or more tools, will also soon be offered for sale. The Ordnance Department is completing inventories of tools in more than 300 plants and will offer many millions of dollars' worth of equipment as soon as plans for disposal are finally arranged.

The Ordnance Department is considering plans for the extension of the Watervliet Arsenal, Watervliet, N. Y., and proposes to spend \$10,000,000 for buildings and equipment. A part of the plant would be devoted to the manufacture of 14-in. guns.

Industrial construction is proceeding at a rapid rate in the Detroit district. Manufacturing operations are expanding and there is a serious shortage of skilled labor. Among the new projects is a \$3,000,000 plant to be built by the Detroit Seamless Steel Tubes Co. The General Motors Corporation is going ahead at once with numerous projects recently announced.

It is reported from Chicago that the tractor industry has suffered a slump because farmers are waiting for lower prices. The new tractor plant of the Allis-Chalmers Mfg. Co., Milwaukee, is held in abeyance on this account and the General Motors Corporation will not equip its Janesville, Wis., plant for manufacturing, but will use it for assembling.

Business in Cleveland is fairly good, coming mostly from Detroit and vicinity. The Goodyear Tire & Rubber Co., Akron, Ohio, will buy about 20 tools and the Liberty Steel Co., Warren, Ohio, requires 13. The new Fate-Root-Heath Co., Plymouth, Ohio, will let a contract for a new plant, which, with equipment, will cost about \$200,000.

Reductions of prices on milling machines, upright drills and radial drills have become more general, but not all makers of cutter and tool grinders have reduced.

## New York

NEW YORK, May 6.

Conditions in the machine-tool business in the East are not good, although a slight improvement has been noted in the past week. The trade seems hopeful that the signing of the peace treaty, the conclusion of the Victory loan campaign and the settlement of the steel price controversy will usher in the peace expansion of industry to which machine-tool distributors have been looking forward for some time. In the midst of somewhat depressing conditions it is interesting to note that a few of the machine-tool plants are working overtime shifts, while others are reducing working hours and the number of employees. The volume of inquiry in this market is out of all proportion to the number of orders, yet the trade believes that these inquiries are indicative of a substantial amount of business to be placed as soon as there is a more settled feeling in the minds of buyers.

In line with reductions in prices announced in THE IRON AGE last week, other manufacturers of radial drills, upright drills and milling machines have taken similar action, so that in these types of tools a majority of the manufacturers are quoting lower prices. Lowering of prices, however, has not stimulated buying to any noteworthy extent.

It is unquestionably true that some buyers are hoping to find tools among the Government-owned stocks to answer their requirements, but they are looking for prices below those asked for new tools by the manufacturers. In this they will possibly be disappointed for the Bureau of Aircraft Production, War Department, has rejected all bids on 630 tools from the plant of the Union Switch & Signal Co., Swissvale, Pa., because the prices offered were lower than the appraisal value of the tools. In all probability the bidders expected to pick up some real "bargains" but it seems to be the aim of the Government sales agents to get full value for the equipment they sell.

Among the tools used at the Union Switch & Signal Co. plant for the manufacture of Lerhone motors, which are now on sale, are about 100 grinders, principally Landis, Norton and Heald; nearly 200 milling machines, principally Becker, Briggs, Le Blond, Kearney & Trecker and Cincinnati; about 100 lathes, mostly Lodge & Shipley and Le Blond; 27 Warner & Swasey turret lathes; 21 Gisholt turret lathes; 11 Lees-Bradner thread millers, 8 Gisholt vertical boring mills; 12 Racine hack saws; a number of National, Superior and other drills; presses, keyseaters, axle boring machines and other tools.

The Bureau of Aircraft Production will shortly offer for sale the equipment in the Long Island City plant of the Wright-Martin Aircraft Corporation, consisting of more than 1000 tools, many of which had been used but a short time.

One of the largest inquiries before the trade comes from the E. W. Bliss Co., Brooklyn, for the equipment of a new shop. Eleven large planers, 3, 4, 6, 8, 10 and 12 ft.; one 24 in. shaper; one 16 in. shaper; one 24 in. slotter; one 12 in. slotter; 1 6 ft. Pond drill; four 6 ft. radial drills; four lathes, 24, 30, 36 and 54 in.; four horizontal boring mills and two vertical boring mills are wanted.

The Standard Oil Co. of New Jersey has issued a supplemental inquiry for tools to be shipped to Rumania. None of the tools inquired for several weeks ago has been bought. The new list calls for one 18 in. crank slotting machine, one 52 in. vertical drilling machine, one 32 in. vertical drilling machine, three 18 in. x 8 ft. geared head engine lathes, three 24 in. x 12 ft. 8-speed geared head high-duty engine lathes; two 27 in. x 13 ft. 8-speed geared head high-duty engine lathes one universal hand miller, one automatic bolt cutter, one 30 in. x 42 ft. engine lathe, three pipe threading and cutting machines. Equipment for a repair shop at Bayway, N. J., will be bought from the purchasing department of the Standard Oil Co. of New Jersey in New York City. Negotiations have been carried on up to this time through the engineering staff at Bayway.

The Brooklyn Navy Yard requires 12 16-in. engine lathes, on which bids are being taken by the Navy Department.

The Federal Shipbuilding Co., Kearny, N. J., bought a number of drilling machines last week and is reported to be ready to come into the market for about \$250,000 worth of equipment for a drydock and ship repair plant adjoining its shipyard.

The Dubied Machinery Co., 350 Broadway, New York, has placed verbal orders for about 100 tools—lathes, milling machines, shapers, gear cutters, grinders, etc.—for shipment to its knitting machinery plants in Switzerland and England. Confirming orders, it is expected, will be forthcoming soon. There was keen competition for this business and some of the bidders made concessions in prices, equivalent to about 5 per cent reduction, by agreeing to deliver the tools f.a.s. New York at the price originally quoted f.o.b. their works.

After many weeks delay the Bureau of Yards and Docks, Navy Department, has issued a list of specifications for the cranes to be bought for the naval ordnance plant at Charleston, W. Va. Machine-tool equipment, totalling \$3,000,000 or \$4,000,000, was bought for this plant several months ago, the bulk of the order going to one large company which specializes in heavy tools. The ordnance plant was designed for the manufacture of both armor plate and naval guns. Cranes required for the open-hearth department are to be of the following capacity: One 250-ton, one 125-ton, one 75-ton, one 25-ton, two 15-ton, two 200-ton and two 100-ton. For serving the hydraulic presses two 250-ton and one 75-ton cranes will be required. For the machine shop and heat treatment building eight 75-ton and one 150-ton cranes are wanted. Bids for these 22 cranes will be closed at Washington on May 19.

Machine-tool export trade remains quiet, but an improvement is expected to follow the signing of the peace treaty. The machine-tool trade has commented on the number of representatives of Swedish machine-tool agencies who have visited this country recently. Some of these companies are known to have had rather close affiliations with Germany in the past. In fact, it is now known that British concerns succeeded in obtaining German machine tools from Sweden during the war and in all probability a considerable number of machine tools from other countries made their way into Germany through Sweden. Under these circumstances it is not surprising that the visits of some Swedish representatives to make American connections have not been altogether satisfactory. Some in the trade say it is questionable whether lines will be drawn so tightly after the peace treaty has been signed. A Belgian company which before the war handled German tools exclusively has made arrangements with some of the leading

American machine-tool builders to handle American tools, and apparently there is nothing to prevent such American tools from reaching Germany should Belgium wish to do business with her again.

Very little crane business is being placed. It is expected, however, that Westinghouse Church Kerr & Co. will this week buy three 10-ton grab bucket cranes, for which they inquired several weeks ago. Davies & Thomas, Calaisauqua, Pa., are in the market for a 16-ton and a 25-ton crane.

The Ordnance Department, Washington, is considering plans for the erection of extensions to the arsenal at Watervliet, near Troy, N. Y. It is proposed to purchase about 35 additional acres and build a number of large additions, with the installation of machinery and equipment for increased capacity; a section of the works, it is said, will be equipped for the manufacture of 14-in. guns. The expansion plans call for an expenditure in excess of \$10,000,000, making the Watervliet Arsenal the principal plant of its kind in the country. It is planned to give employment to over 7000 men. Colonel Mettler is in charge. In this connection, the department has decided to maintain finishing and manufacturing arsenals, in addition to the Watervliet works, as follows: Edgewood, Md.; Amatol, N. J.; Tullytown, N. J.; Frankford, Pa.; Rochester, N. Y.; Erie, Pa.; Chicago, Ill. (shell machining plant); Madison, Wis.; Old Hickory, Tenn.; Rock Island, Ill.; and Watertown, Mass. The present plant at Springfield, Mass., is also being considered as a permanent works.

The Equitherm Control Corporation, 30 Church Street, New York, has leased the four-story building at 13 Tillary Street for a new local works. It also operates a plant at 203 Greenwich Street.

The Liquid Carbonic Co., Thirty-first Street and Kedzie Avenue, Chicago, manufacturer of soda fountains and equipment, has awarded contract to the George A. Just Engineering Co., 239 Vernon Avenue, Long Island City, for a new plant on Maspeth Avenue, Brooklyn, to cost \$35,000.

The Consolidated Fastener Co., New York, has been incorporated with a capital of \$150,000 by G. Shapiro, A. W. Cummins and P. Crawford, 260 William Street, to manufacture metal fasteners, etc.

The Vulco Steel Products Corporation, New York, has been incorporated with a capital of \$50,000 by D. F. Lewis, H. O. Lehman and G. E. Fleming, 149 Broadway, to manufacture steel and iron specialties.

The Steel Alloys Co. of America, New York, has been incorporated with a capital of \$50,000 by M. O. Bennett, L. D. Schwartz and W. T. Jerome, 37 Wall Street, to manufacture steel.

The Industrial Engineering Co., 30 Church Street, New York, has increased its capital from \$100,000 to \$200,000.

The Kelmert Corporation, New York, has been incorporated with a capital of \$20,000 by J. E. McCrady, H. L. Trisch and L. Conover, 352 St. John's Place, Brooklyn, to manufacture tools and implements.

The Arrow Flexible Conduit Co., New York, has been incorporated with a capital of \$6,000 by H. Ginsburg, A. Rapaport and M. Janiger, 218 Grand Street, to manufacture metallic conduits.

Steele Brothers, Inc., New York, has been incorporated with a capital of \$15,000, by M. J. Goldstein, H. and S. Steele, 1705 Anthony Avenue, to manufacture tools and machinery.

The Robert Phillips Co., New York, has been incorporated with a capital of \$125,000, by H. E. Cook, J. and Robert Phillips, 101 Park Avenue, to manufacture electric and gas fixtures.

The Eagle Pencil Co., 703 East Thirteenth Street, New York, has completed plans for a six-story addition, 75 x 200 ft.

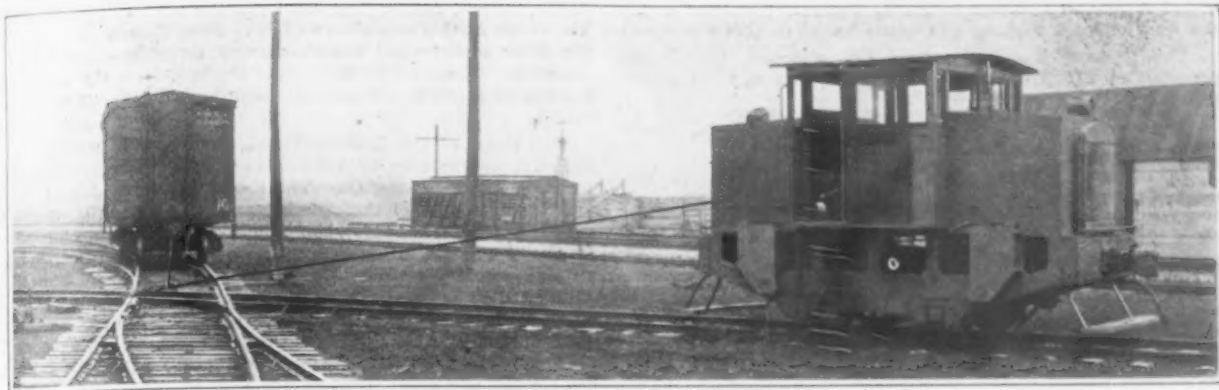
The Hoag Superheater Co., New York, has been incorporated with a capital of \$10,000 by E. S. Toothe, A. Nathan and E. S. Rothschild, 524 Fifth Avenue.

The Uris & Pape Iron Works, Brooklyn, have been incorporated with a capital of \$10,000 by C. E. Pape, H. E. Herman and M. Uris, 148 West 118th Street, New York.

The Newton Arms Corporation, New York, has been incorporated with a capital of \$600,000 by W. A. Courtland, H. W. Cotton and W. B. Morrell, 34 Thirty-fifth Street, Brooklyn, to manufacture rifles, ammunition, etc.

The Erie Basin Auto Repair Co., Brooklyn, has been incorporated with a capital of \$10,000 by B. F. McCormick, B. J. and J. B. McManus, 1056 Fifty-third Street, Brooklyn.

Plaskett, Lozier & Co., New York, have been incorporated with a capital of \$10,000 by K. D. Lozier, G. F. Plaskett and W. Lamb, 172 Fulton Street, to manufacture iron and steel products.



The standard gage gasoline switching locomotive illustrated is made by Geo. D. Whitcomb Co., Rochelle, Ill. The locomotive is equipped with a horizontal opposed engine, with heavy transmission, and has a capacity, it is stated, to handle six to eight standard gage loaded freight cars in an ordinary switching method, and an auxiliary capacity with the use of the reel which clutches in on the engine when the locomotive

is anchored on the track, to handle a string of 20 loaded freight cars.

The particular service this machine is to render is to handle a loaded coal car of 100,000 ton capacity up a 200-ft. 6 per cent grade. This will be done by anchoring the locomotive to the track at the top of the grade and putting the reel in operation.

The Burglar Proof Lock & Hardware Corporation, 75 Fulton Street, New York, has filed notice of change of name to the Segal Lock & Hardware Co., Inc.

The Warner Service & Repair Corporation, New York, has been incorporated with a capital of \$15,000 by A. and B. and O. Gunsten, 1041 Seventy-third Street, to manufacture elevators and hoisting equipment.

Jacob Mattern & Sons, Inc., 215 West Fifty-third Street, New York, manufacturer of auto wheels and rims, has increased its capital from \$25,000 to \$50,000.

John Lurie, Inc., New York, has been incorporated with a capital of \$110,000 by H. W. F. Adams, S. L. Schwarz and John Lurie, 1789 Broadway, to manufacture airplane and auto parts, supplies, etc.

Joshua Horrocks, Inc., Brooklyn, operating an iron and wire works at 41 Schenectady Avenue, has had plans prepared for alterations and extensions to its three-story plant; 100 x 150 ft., to cost about \$5,000.

The Eastern Scale Co., Delawanna, N. J., has been incorporated with a capital of \$125,000 by Eugene R. Geddes, George W. Newton and Edward C. Vannaman, Jr., all of Passaic, to manufacture weighing and counting machinery.

The Service Machine Co., Elizabeth, N. J., has been incorporated with a capital of \$75,000 by I. G. Segel, Edward D. Wolfe, and William F. Burditt, Jr., to manufacture tools and machinery.

A machine and mechanical department will be included in the new vocational school to be erected by the Board of Education, New Brunswick, N. J., on Eaton Avenue.

The Vulcan Detinning Co., Sewaren, N. J., has completed the erection of a one-story addition, 100 x 100 ft.

The Everlasting Drill Co., Morgan Street, Jersey City, N. J., has filed notice of organization to manufacture drills, etc. John J. Mooney, 159 Linwood Street, Brooklyn, heads the company.

The Foundation Co., 233 Broadway, New York, has finished up all work at its Kearny, N. J., shipyard, and it has been decided to place the plant in the hands of wreckers for immediate removal. This work will be handled by the Goldberg Wrecking Co., Jersey City, and is said to be one of the largest undertakings of its kind ever arranged in the East; the property comprises three shipways, two docks, and 47 construction and shop buildings. It is estimated that well over 500 tons of iron will be taken from the job and over 2,500,000 ft. of lumber.

The Para Mfg. Co., Weehawken, N. J., has been incorporated with a capital of \$50,000 by Thomas J. Wilson, A. E. Moore, and Herbert E. Lawrence, to manufacture fountain pens, etc.

The New Jersey Cutlery Co., 192 Market Street, Newark, N. J., has awarded a contract to A. C. Windsor, 368 Sanford Avenue, for a one-story plant, 100 x 175 ft., at 692 South Sixteenth Street, to cost \$31,000.

The Broad Street Metal Works, 448 Broad Street, Newark, N. J., has filed notice of organization. Samuel Sommer, 286 Belmont Avenue, heads the company.

The Ingang-Pullen Cutlery Co., 50-58 Columbia Street, Newark, N. J., has filed notice of organization to manufacture cutlery products. Louis Ingang and F. Pullen head the company.

Seither & Ellis, Inc., Newark, N. J., have been incor-

porated with a capital of \$125,000 by F. J. Seither and Andrew C. Ellis to manufacture brass and other metal products.

Hodecker Brothers, 375 Market Street, Newark, N. J., specializing in electroplating, have filed plans for a brick factory at 27-29 Commercial Street.

The Eastern Auto Radiator Co., 288 Halsey Street, Newark, N. J., has filed notice of organization. William Kretschman heads the company.

Jean Heybroek, wholesale ironmonger from Holland, arriving about the middle of May for visiting leading manufacturers in the hardware branch in the United States, asks for quotations and particulars. He may be addressed in care of E. C. Atkins & Co., Inc., 56 Reade Street, New York.

The Electrolytic Oxy-Hydrogen Laboratories, 15 William Street, New York, announces that it has closed an additional contract with the Paschal Oxygen Co., selling agent for the oxygen generated at the Fels & Co. plant, so that the Paschal company, located at Seventy-third Street and Woodland Avenue, Philadelphia, will place 1000 additional oxy-hydrogen generating cells in operation.

## Buffalo

BUFFALO, May 5.

The Eberhart Steel Products Co., Buffalo, recently incorporated, is arranging for the erection of a manufacturing plant. C. Eberhart, Jr., 535 Northland Avenue, is manager.

Plans are being drawn by Howard Beck, city engineer, Municipal Building, Buffalo, for a two-story boiler house for almshouse at Williamsville, N. Y., to be erected by the Board of Supervisors of Erie County, N. Y.

The Zahm & Nagel Co., Buffalo, has been incorporated with a capital stock of \$100,000 to manufacture machinery and factory supplies. C. Pond, C. A. Nagel and E. Zahm, 74 East Dewey Avenue, are the incorporators.

The Rochester Ball Bearing Co., Rochester, has increased its capital stock from \$5,000 to \$90,000.

The Buffalo Polish American Foundry Co., Buffalo, recently incorporated with a capital stock of \$50,000, is arranging for the establishment of a plant and will purchase equipment. S. Marcinjak, 580 Amherst Street, is manager.

The Toscan Stove & Mfg. Co., Jamestown, N. Y., will soon have plans completed for a manufacturing plant to be erected this spring. James E. Toscan is president.

The Rochester Railway & Light Co., Rochester, will issue bonds to the amount of \$500,000 for a power plant addition.

The American Valve Co., Coxsackie, N. Y., is completing plans for the installation of new metal-working machinery in a manufacturing plant recently acquired.

The Northern New York Utilities Co., Watertown, N. Y., is having bids taken by James P. Brownell, 19 Strickland Block, Carthage, N. Y., for construction of a concrete and steel power plant, dam and canal on Black River, Watertown, estimated to cost \$250,000.

The Reliable Stamping Co., 1392 Niagara Street, Buffalo, is having plans drawn for a factory, 38 x 90 ft., which it will build at an estimated cost of \$20,000.

The U. S. Alloys Corporation, Niagara Falls, N. Y., is taking bids for construction of a steel and corrugated iron building, 60 x 65 ft., one story, at its plant on Witmer Road.

The Kingsboro Silk Mills, Gloversville, N. Y., has

awarded general contract to Morell Vroman, Gloversville, for the erection of a factory and boiler house to cost \$20,000.

The Chicago Pneumatic Tool Co., Chicago, has leased property at 210 Franklin Street, Buffalo, for a local establishment.

The Rochester Ball Bearing Co., 203 State Street, Rochester, N. Y., has increased its capital to \$90,000.

In connection with its proposed expansion plans, the manufacturer of tools, chucks, etc., has had plans prepared Weekes-Hoffman Co., Dickerson Street, Syracuse, N. Y., for a one-story addition, 46 x 87 ft. The company recently increased its capital from \$200,000 to \$500,000.

George C. Meyers, North Tonawanda, N. Y., is planning the rebuilding of his planing mill and wood-working plant, recently destroyed by fire with a loss of over \$30,000.

The Jurk Auto Safety Device Co., Buffalo, has been incorporated with a capital of \$100,000 by A. H. Jurk, F. A. Shoemaker and H. T. Chamberlain, to manufacture special metal devices.

The Metal & Alloy Specialty Co., Buffalo, operating a foundry at 25 Illinois Street, will build a one-story plant building, 20 x 30 ft., at Elmwood and Hertel avenues.

The new foundry to be established by Levering Brothers, Baltimore, Md., at Buffalo, in the structure recently erected by the Pierce-Arrow Motor Co., and acquired a few weeks ago, will be used to specialize in the production of sash weights. The company has made an offer to the city of Buffalo for baled tin and iron scrap, at a price said to be \$4 a gross ton, and \$5 a ton for tin cans, for a period of five years. The City Commission is planning to accept the offer and proposes to purchase a steel baling press for service at the municipal utilization plant.

The New Era Toy Co., Buffalo, has been incorporated with a capital of \$10,000 by A. J. Albert, A. B. Yox and W. Raber, to manufacture mechanical toys.

The Harold L. Frankie Co., Buffalo, has been incorporated with a capital of \$50,000 by C. Pond, L. K. Lynn and H. L. Frankie, to manufacture iron and steel products.

The Henderson Tire & Rubber Co., Buffalo, has increased its capital from \$200,000 to \$350,000.

The Charles Newton Rifle Corporation, Buffalo, has been incorporated with a capital of \$20,000 by Charles Newton, A. H. Dayton and D. A. Evans, to manufacture rifles, etc.

## New England

Boston, May 5.

Steady, even if admittedly slow, progress continues in this section, the total of building operations showing greater volume in number of enterprises and in amount of money involved, compared to a year ago, though still lagging behind the record for the same week in 1917. A tie-up of foundry plants in the Connecticut valley has been in prospect but was averted May 1 by a tentative understanding that the molders will remain at their jobs for a flat minimum rate pending a definite settlement by negotiation.

The carpet branch of the textile industry has shown distinct liveliness and a thousand employees of South Worcester and Palmer plants have received a 10 per cent increase of wages similar to that recently granted the workers at the factory at East Dedham, Mass. While these plants have not their pre-war quota of employees, it is expected that if present growth goes on it will be only a few months before the factories regain their old stride.

Interest is keen on the subject of Americanization and various cities show evidence of the continued advancement of this movement.

Receptions to the homecoming soldiers during the past week, as in Hartford and other cities, have called for shut-downs on the days scheduled for the principal parades.

William H. Gates, treasurer Baldwin Chain & Cycle Mfg. Co., Worcester, Mass., has returned from a trip through the Middle West in the interest of his company, during which he made a personal investigation of the tractor industry as it affects the transmission chain business in which the company specializes. He found the tractor plants dull, with very large stocks of completed machines on hand; stocks so large, in fact, that thousands were stored out of doors. The reason for this condition, Mr. Gates ascertained, is that the farmers of the country are holding back for lower prices, which the manufacturers do not plan to grant. They state they can see no reason why costs should go down, and therefore prefer to hold their goods rather than to offer them at a sacrifice. The farmers have plenty of money and want tractors; in fact need them. It is expected that the firm stand of the producers will result before a great while in a growing demand,

as the farmers realize they must pay the price or go without. The result of this condition as felt in New England is a postponement of expected large contracts for tractor parts and materials. Some business is being received from this source, but not so much as the general condition of agriculture warrants.

The name of the J. F. & W. H. Warren Co., Worcester, Mass., manufacturer of leather belting, has been changed to the Warren Belting Co. The recent deaths of Henry W. Warren, president of the company, and J. F. Warren, treasurer and general manager, has resulted in important changes in the personnel of the management, in which a group of men who have been prominent in the Graton & Knight Mfg. Co., Worcester, take active part. W. A. Place has been elected president and W. H. Bowman treasurer, while W. H. Warren continues assistant treasurer, an office which he has held for several years. Messrs. Place and Bowman are Graton & Knight men, as are Earl W. Parks and Francis F. Kneeland. Mr. Parks has had 26 years' practical experience in the tanning and currying business, his specialty being currying belt leather, while Mr. Kneeland has been engaged in the making of belts and leather specialties for 28 years and is recognized as an expert.

The Sleeper & Hartley Co., Worcester, manufacturer of spring and other special metal-working machinery, will rush the construction of its new one-story factory, 60 x 200 ft., on the north side of Chandler Street, near Reed. It was planned to build earlier, but high cost of materials held the work back. Now the room is imperatively needed because of an order for 100 wire nail machines for the French High Commission for reconstruction work in France. At present the company is operating two factories, one on Prescott Street, the other on Lagrange Street. With the completion of the new building the business will be under one roof.

An \$8,000 shop, 58 x 100 ft., brick, will be built by the Smith Plumbing & Auto Co., Springfield, Mass.

Contractors have submitted bids on the proposed foundry building, one story, 100 x 200 ft., brick, for the Davis Foundry Co., Lawrence, Mass.

The Scovill Mfg. Co., Waterbury, Conn., has begun the erection of a brick and steel building, one story, 50 x 120 ft., to cost \$10,000.

The Providence Body Co., Providence, R. I., will build a factory, one story, 60 x 300 ft., \$40,000, for the manufacture of automobile and wagon bodies.

The North End Carriage & Auto Co., Hartford, Conn., will build a shop, \$5,000, one story, 40 x 80 ft., for the manufacture and repair of automobile bodies.

Additions to the manufacturing plant are in course of construction for the Fellows Gear Shaper Co., Springfield, Vt., one being two stories, 144 x 147 ft., and the other three stories, 42 x 102 ft.

Some \$4,000 are planned to be expended on alterations, two stories, 18 x 22 ft., brick, to a factory building of the George H. Coates Clipper Co., Worcester, Mass.

The Needham Tire Co., Charles River Station, Needham, Mass., will erect a factory building, one story, 98 x 140 ft.

Scott & Williams, manufacturers of knitting machines, Laconia, N. H., are receiving bids on the erection of a factory building, five stories, 63 x 200 ft., of reinforced concrete.

An \$18,000, two-story, 60 x 83 ft., brick factory addition is under way for J. C. Doran & Sons, Providence, R. I., and subject to lease by the Automatic Gold Chain Co. of that city.

Erection of an auto service station, \$30,000, two stories, 65 x 106 ft., of brick and reinforced concrete, is under way for Guy Fairfield, Keene, N. H.

Contractors are figuring on the plans for the torpedo storage buildings for the Navy Department. These will be erected at Newport, R. I., and involve an expenditure in the neighborhood of \$250,000. Bids will be closed on May 12 at the office in Washington of the Chief, Bureau of Yards and Docks.

Work has begun on the erection of a factory building, brick, two stories, 65 x 120 ft., for the Standard Envelope Sealer Co., Everett, Mass. The equipment will be electrically operated.

Contracts have been placed for the erection of an auto service building, \$350,000, six stories, 12,000 sq. ft., for E. L. Snider, Boston, Mass.

The Century Machinery Co., Springfield, Mass., has been incorporated with a capital of \$600,000 by Anton C. Schmelzer, Nathan P. Avery and R. L. Davenport, to manufacture machinery and tools.

Wilson Brothers & Kent, Inc., Augusta, Me., has been incorporated with a capital of \$3,000,000 by E. L. McLean.

C. B. Chapman and G. M. Benson, to manufacture power and pumping plant equipment, etc.

The Abercrombie-Bock Electric Co., Bridgeport, Conn., has been incorporated with a capital of \$10,000 by Francis J. and Harry C. Abercrombie, Bridgeport, and Fred W. Bock, Hartford, to manufacture electrical specialties.

The Petterson Engineering & Mfg. Co., 311 Main Street, Worcester, Mass., has been incorporated with a capital of \$25,000 by Arthur R. Petterson, Charles L. Jernberg and Andrew P. Werme, to manufacture a combination drill and valve grinder and other equipment.

The Eureka Screen Co., Hartford, Conn., has increased its capital from \$30,000 to \$150,000.

The Springfield Foundry Co., Indian Orchard, Mass., will build a one-story addition to its plant, 80 x 100 ft.

The Gordon Electric Mfg. Co., Waterbury, Conn., has been incorporated with a capital of \$75,000 by Ira R. Seltzer, A. J. Smith and N. A. Niell, to manufacture electrical devices.

The Hartford Rubber Works, Hartford, Conn., has awarded a contract to the J. H. Grozier Co., 721 Main Street, for the erection of a one-story addition to its plant, about 60 x 75 ft., to cost \$34,000.

A new company to manufacture wire products is being organized by Carl B. and Paul R. Chamberlain, 17 Sudbury Street, Worcester, Mass., and has arranged to take over the works and business of the late H. J. Chamberlain, Pawtucket, R. I., with the establishment of a plant at 47 Main Street, Worcester, for the production of its specialties, which will include wire boilers and other products.

The Cinch Lock-Nut Co., Portland, Me., has been incorporated with a capital of \$2,500,000 by R. L. Johnson, H. I. Smith and A. B. Farnham, to manufacture locks, tools and machinery.

The Ordnance Department, Washington, will build a two-story and basement addition to the engine house at the Hill Shops, Springfield, Mass., Arsenal, to cost about \$25,000.

## Pittsburgh

PITTSBURGH, May 5.

Announcement is made that John Stevenson, Jr., a capitalist and former well known steel manufacturer of Sharon, Pa., has purchased a controlling interest in the plant of the Standard Car Construction Co., whose works are at Masury, near Sharon. The Standard company was organized about three years ago for the manufacture of steel tank cars and plate work, and has increased its capacity from time to time. At present it has a capacity for a daily output of about 20 tank cars.

The Ritter-Conley Mfg. Co., Pittsburgh, is building a one-story steel galvanizing plant, 65 x 250 ft., at its works at Leetsdale, Pa.

The Budke Stamping Co., Canonsburg, Pa., contemplates building an addition to its plant.

The Pennsylvania Iron & Steel Products Co., New Castle, Pa., recently increased its capital stock from \$100,000 to \$150,000.

The Center Foundry Co., Wheeling, W. Va., has acquired a site on which it proposes to build a new plant.

The Youngstown Boiler & Tank Co., Youngstown, recently organized, will start business in a short time. Connected with the company are C. R. Vogle, James P. Keene and W. R. Kirby, all formerly associated with the Sharpsville Boiler Co., Sharpsville, Pa., Mr. Vogle having been auditor, Mr. Keene general manager and Mr. Kirby general superintendent.

The Pittsburgh Perforating Co., Pittsburgh, a subsidiary of the Chicago Perforating Co., has leased a one-story foundry and machine shop, 100 x 106 ft., from the Best Co., on Railroad Street.

The Pittsburgh Model Engine Co., Pittsburgh, has taken out building permits for a three-story brick and steel plant on Lexington Avenue, to cost about \$130,000. A one-story brick and steel works to cost \$10,000 will also be erected there.

The Pennsylvania Die Casting & Mfg. Co., East McKeesport, Pa., has been incorporated in Delaware, with capital of \$100,000 by R. A. Piebles, East McKeesport; J. M. Vero, Munroeville, and F. H. Woumans, Wilkinsburg.

The Wheeling & Lake Erie Coal Co., Cleveland, a subsidiary of M. A. Hanna & Co., has acquired the properties of the Pittsburgh-Belmont Coal Co., at Neffs and Lafferty, W. Va. The properties are said to be valued at \$1,500,000, and will be operated in conjunction with its other mines at Connorsville, in this district. Plans are under way for extensive production.

The Beech Bottom Power Corporation, Wheeling, W. Va., has been incorporated with a capital of \$400,000 by Allen E. Moore, George F. Jebbitt and Alfred F. McCabe, to establish and operate electric power plants.

The coal tipple of the Island Creek Coal Co., Holden, W. Va., was recently destroyed by fire with loss estimated at \$50,000.

The Northern Virginia Power Co., Millville, W. Va., has completed plans for an addition to its electric power plant.

The Gee Electric Co., Wheeling, W. Va., is inquiring in this market for a 24-in. by 12-ft. lathe, a 16-in. by 8-ft. lathe and one 20-in. shaping machine.

The American Valve & Tank Co., Fairmont, W. Va., has been incorporated with \$350,000 capital stock by E. C. Frame and others.

The Ohio Valley Mine Car Mfg. Co., Huntington, W. Va., has been incorporated with \$100,000 capital stock to manufacture and repair mining cars. J. W. Heron is one of the incorporators.

## Baltimore

BALTIMORE, May 5.

The Magneto & Machine Co., 1031 Cathedral Street, Baltimore, has awarded contract for a machine shop, 21 x 62 ft., to cost about \$2,500.

The Board of Awards, City Hall, Baltimore, is receiving bids to furnish and erect a 400-hp. water-tube boiler and three 265-hp. side-feed stokers and drivers for the city pumping station.

The Rupp Mfg. Co., Hagerstown, Md., manufacturer of machinery, which was recently destroyed by fire, will be rebuilt.

The United States Air Products Co., Frederick, Md., is said to be planning the establishment of a plant for the manufacture of automobile starters.

The Newport News Foundry Co., Newport News, Va., has been incorporated with \$25,000 capital stock. E. L. Fuller is secretary.

The Southern Electric Steel Co., Lynchburg, Va., has been organized and plans to install machinery. Prices are wanted on 1-ton electric furnaces, heat-treating plant, annealing ovens, traveling cranes and other equipment. J. N. M. Keyzer is president and designing engineer.

Hackley Morrison, Richmond, Va., wants prices on 150-hp. horizontal tubular boilers and second-hand 30-in. gage locomotives.

C. H. Froberg, Norfolk, Va., will receive prices on die-casting machinery.

The Morgantown & Kingwood Railroad, Morgantown, W. Va., plans to build a one-story engine shop and repair house, 40 x 120 ft.

Additional machinery will be installed by the Motor Co. and the Universal Auto Co., Winston-Salem, N. C.

The Hamme Marine Railway, Wilmington, N. C., which plans to construct steel and wooden ships, will build a plant and install electric machinery. R. F. Hamme, Jr., is president.

W. L. Stubbs, Greenville, N. C., is in the market for 30-hp. kerosene engines.

The Cotton Oil Co., Bamberg, S. C., will receive quotations on 150-hp. boilers, 450-hp. heaters and power pumps.

The Dorchester Lumber Co., Badham, S. C., wants prices on double-cylinder hoisting engines.

The Southern Fertilizer & Chemical Co., Savannah, Ga., will build a plant near Savannah to cost about \$500,000, it is said, and install cranes and other machinery.

Prices on locomotive cranes are wanted by the Southern Engineering & Construction Co., West Palm Beach, Fla.

The Ohio Valley Mine Car Mfg. Co., Huntington, W. Va., has been incorporated with \$400,000 capital stock by J. W. Heron, M. E. Brown and others.

The Guyan Machine Works, Logan, W. Va., wants prices on 25-hp. electric hoists, hoisting drums, 44 and 48-in. gage storage battery locomotives and 6 and 8-in. cast-iron pipe.

Swift & Co., Eutaw and Camden streets, Baltimore, will build a one-story brick addition to their engine plant on Perry Street, 40 x 90 ft.

The Carolina Electric & Machinery Co., Greenwood, S. C., has been incorporated with a capital of \$25,000 by J. B. Walton, E. O. Bass and E. S. Moorner.

The E. V. Williams Co., North Wilkesboro, N. C., has been incorporated with a capital of \$50,000 by E. V. Williams and associates to manufacture machinery, parts, etc.

The Bureau of Yards and Docks, Navy Department, Washington, is planning extensions and betterments in the electric

power plant at the naval works at Pensacola, Fla., estimated to cost \$50,000.

The Tallahassee Light & Power Co., Tallahassee, Fla., is planning the rebuilding of its power plant recently destroyed by fire with loss estimated at \$75,000.

The Patent Window Syndicate, Richmond, Va., has been incorporated with a capital of \$10,000 by M. S. Gary and J. H. Oliver.

The New River Coal Co., Whipple, N. C., is planning the erection of new coal tipples at Whipple, Lochgelly and Summerlee.

McCord & Satterfield, Macon, Ga., are planning a new four-story automobile works, for the manufacture of parts for pleasure cars and tractors, and other work. A site, 200 x 210 ft., has been acquired.

## Detroit

DETROIT, May 5.

Industrial construction is increasing at an unprecedented rate. Leading the announcements the past week were the General Motors projects, running into millions, and the new plant of the Detroit Seamless Steel Tubes Co., which will cost \$3,000,000. Numerous additions to works are being planned and will be announced shortly. Building permits in March increased 193 per cent over the same month of the previous year, and the April increase will be even larger.

Machine tool jobbers report a great demand for standard machines, while numerous inquiries are being received for special machines.

Labor difficulties are not as serious as the housing situation, which is preventing manufacturers from securing enough employees for the great industrial expansion in the manufacturing centers. Saginaw, Mich., in two years has added 22,000 employees, and similar growth is reported in Flint and Pontiac. Detroit is far behind in housing facilities, with hundreds of workmen coming into the city daily.

Plans for the development of the General Motors property on both sides of Holbrook Avenue, Detroit, were disclosed with the application for permission to run two side-tracks across Holbrook Avenue. This tract will contain a motor plant, differential gear plant, die shop, heat treating plant, forge shop of the Central Forge Co., and an axle plant. Later a large truck assembling plant will be erected. The land comprises nearly 60 acres.

The new plant of the Cadillac Motor Co., Detroit, will be on Scotten Avenue on the former site of the American Car & Foundry Co. It will be one of the largest of the General Motors Corporation's new projects.

The plant of the Fisher Body Corporation, West End Avenue and Fort Street, Detroit, has been converted into an automobile body building plant. During the war it was built and operated for aeroplane body production.

The M. & S. Corporation, differential manufacturer, which has operated a factory in Detroit for several years, has moved to 1107 East 152d Street, Cleveland. W. T. Walker, formerly of the Walker-Weiss Axle Co., Flint, Mich., is president and general manager. The name of the product has been changed to Powerlock.

The L. A. Young Industries, Inc., Detroit, has purchased the factory of the Borden Milk Co., Jackson, Mich., with 150,000 sq. ft. of floor space, and will shortly announce the purchase of another plant in the city, both of which will be operated as part of the wire division of the company. L. A. Young is head of the concern.

The Stecker Electric & Machine Co., Detroit, is planning a new factory building.

The Detroit Copper & Brass Rolling Mills, Detroit, is contemplating an addition to its plant.

The Atlas Press Co., Kalamazoo, Mich., is planning the erection of new works in the northern section of the city.

The Swedish Crucible Steel Co., Detroit, is planning to bring out a 2-ton truck.

The Briscoe Motor Corporation, Jackson, Mich., has taken over a large proportion of the Jackson Automobile Co. plant.

The Kalamazoo Angle Steel Shed Co., Kalamazoo, Mich., is planning for the rebuilding of the section of its works recently damaged by fire with loss estimated at \$7,500.

The Petroskey Portland Cement Co., Petroskey, Mich., is having plans prepared for the erection of a new plant to cost about \$500,000, with machinery, etc. J. C. Buckbee & Co., 38 South Dearborn Street, are the engineers.

The Johnston Machine Co., 515 East Forest Avenue, Detroit, is planning for the erection of a top addition to its plant, 61 x 70 ft., to cost \$10,000.

The Wilson Foundry & Machine Co., Pontiac, Mich., is planning for the construction of an addition to its plant, 150 x 200 ft., to be used as a foundry. C. B. Wilson is president.

The Grand Rapids Brass Co., Grand Rapids, Mich., will build a three-story and basement addition, 92 x 100 ft.

## Milwaukee

MILWAUKEE, May 5.

A fair amount of new business is being booked, but orders are confined to one or two tools, indicating that the hesitancy which has affected the market for some time still exists. Encouragement, however, is found in the steady stream of inquiries which place in prospect a number of fair-sized lots. The demand in general is decidedly spotty and of a strictly hand-to-mouth character. Outside of the automotive industries few concerns are making any purchases.

The Green Bay Drydock Co., Green Bay, Wis., is being organized by local interests headed by Carl Hartmann and will be incorporated with a capital stock of \$500,000, to construct and operate a new floating drydock, 630 ft. long, with a maximum lifting capacity of 6000 net tons. It will be electrically operated and built in four sections to accommodate more than one vessel at a time, although in combination, the largest boats on the Great Lakes may be accommodated singly.

The Modern Grinder Mfg. Co., 157-159 Buffalo Street, Milwaukee, has increased its capital stock from \$10,000 to \$25,000 to finance enlargement of its output. Abraham Strauss is secretary.

The Vim Tractor Co., Schleisingsville, Wis., has been organized with a capital stock of \$75,000 to take over and develop the business of the Standard Mfg. Co., of the same city, which has been manufacturing gasoline and kerosene engines and recently perfected a farm tractor design. Arrangements are being made to place the tractor in production. Some new shop equipment is being purchased and later an extension to the plant will be erected. William F. Wolf is secretary.

The Webster Electric Co., Racine, Wis., manufacturing ignition devices for automobiles, trucks and tractors, will build a two-story addition, 40 x 80 ft., to be used largely for power plant and boiler house purposes. The work is in charge of Edmund B. Funston & Co., architects. Walter Brown is general superintendent.

The Jenkins Machine Co., Sheboygan, Wis., is awarding contracts this week for the erection of a one-story brick and steel machine shop addition, 45 x 196 ft., duplicating and paralleling its present main shop. The architect is Edward A. Juul, local.

The Cudahy Bros. Co., Cudahy, Wis., will build a power plant addition and install a 600-kw. generator set and two 400-hp. boilers. Michael F. Cudahy is president and general manager.

The Samson Tractor Co., Janesville, Wis., a subsidiary of the General Motors Corporation, on April 30 awarded the general contract for the construction of the second unit of its new plant to the J. P. Cullen Co. It will be a duplicate of the first unit 200 x 500 ft., of brick, steel and concrete. The entire project is under the supervision of Frank D. Chase & Co., industrial engineers, Chicago. The General Motors Corporation has apportioned \$4,500,000 for investment at Janesville in the new tractor plant, machinery, equipment, dwelling construction, etc. James A. Craig is general manager of the Samson company.

The Creamery Package Mfg. Co., general offices, Chicago, has decided upon the enlargement of its branch factory at Fort Atkinson, Wis., by the erection of a reinforced concrete and brick addition, 90 x 200 ft., four stories. The enameling department also will be enlarged by a two-story addition, 40 x 90 ft., containing two new ovens. The improvements, including equipment, are estimated to cost from \$200,000 to \$250,000. Harry H. Curtis is local manager.

The F. J. Greene Engineering Works, Racine, Wis., has plans for a one-story brick and steel machine shop and general manufacturing extension, 100 x 125 ft., designed by Edmund B. Funston & Co., local architects. The Greene company will do the erection and construction work direct.

The Inglis Mfg. Co., 283 Fifth Avenue, Milwaukee, manufacturer of oil tanks, pumps, and gages is contemplating the erection of a three-story addition during the year to cost with equipment approximately \$50,000. It is not regarded as likely, however, that the project will be undertaken prior to July 1. Clement W. Inglis is president.

Andrew Roth, architect, La Crosse, Wis., is preparing plans for a two-story brick garage and machine shop, 50 x 120 ft., to be erected at West Salem, Wis., at a cost of \$18,000. The name of the owner is withheld for the present.

The Joseph D. McCord Co., Milwaukee, industrial and sales engineer, moved its headquarters from 816 to 915 Majestic Building, May 1.

The Village Board, Johnson Creek, Wis., is taking sealed bids until May 20, 7.30 p. m., for furnishing and installing a

man-driven pump of 500-750 gal. capacity, in the municipal waterworks. W. A. Christians is clerk.

The Appleton Engine Works, Appleton, Wis., which intended to erect an addition to its plant on Superior Street, has changed its plans and has acquired the vacant property at 1019 College Avenue, which will be remodeled into a machine shop, with a one-story brick addition, 30 x 50 ft. The company manufactures farm gas engines and does a commercial machine and engine repair business.

The Marshfield Welding Works, Marshfield, Wis., owned and managed by Walter Miner, is moving into a larger building and will conduct a general machine repair business and a public garage, in addition to continuing the welding and cutting department.

George C. Yunker, 1334 Scott Street, Milwaukee, has been granted a permit to build a one-story brick machine shop at Twenty-seventh and Forest Home avenues, for the use of Schroeder Brothers. With equipment the shop will cost about \$7,500.

The Wallis Tractor Co., Racine, Wis., interrupted operations in its plant on April 30 for several weeks, during which time much new equipment will be installed and other changes made to effect an increase in the production by June 1 from 10 tractors to 24 tractors per day.

The Perflex Radiator Co., Racine, Wis., recently declared bankrupt, is being continued in operation under the direction of Julius J. Goetz, Milwaukee, who has been appointed trustee under bond of \$50,000 and authorized to continue the business for 30 days from April 28. It is believed that creditors will realize practically 100 per cent.

## Chicago

CHICAGO, May 5.

The volume of business continues fair. Some dealers report that April was the best month this year, while others state there has been a slight falling off in orders since March. A feature of the market is the relatively heavy demand for tools by small consumers. A large local dealer reports that 50 per cent of the orders coming in are from small manufacturers. Many of these are in the class which had no war contracts and made no purchases during the war either because of restrictions under the priority rules or a sharp curtailment of operations. There is a strong demand for small power presses from this division of the trade, as well as from new firms engaged in stamping metal for novelties, an industry which was largely in German hands before the war.

In general, milling machines are selling in larger volume than other types of tools. One important Western manufacturer of milling machines is maintaining practically the same output it did a year ago and is having difficulty in keeping pace with orders. Shapers are also in demand but automatic screw machines, on the other hand, are a drug on the market.

The tractor and agricultural implement business has suffered a slump, but the automobile industry continues to flourish. Motor cycle manufacturers are also busy, one large company in this district being 300 machines behind its orders. Many of the tools for which the Studebaker Corporation has been inquiring have been secured through the acquisition of Government equipment utilized in the company's plants for war production. It is understood that these machines have been assigned to the corporation's tool room and that extensive purchases of additional machines are still to be made. The Illinois Steel Co., which issued a list several weeks ago to cover requirements at Gary, has purchased a number of machines the past two weeks, among them two 42-in. lathes. The Wisconsin Gun Co., Milwaukee, Wis., is shipping part of its tool equipment to the Watervliet, N. Y., arsenal.

One of the interesting developments since the end of the war has been the rapid expansion of the farm tractor industry. Many plants are fully equipped and turning out a considerable number of tractors, but the tractor business has not gotten out as was expected and there is some curtailment of proposed expenditures. For example, the General Motors Corporation has decided not to buy new equipment for its Janesville, Wis., plant, but will use it for assembly purposes only. It was the original intention to buy a large lot of machine tools for manufacturing at Janesville. Likewise the Allis-Chalmers Mfg. Co., Milwaukee, which had planned for a tractor plant, has postponed action. Those who believed that the possibilities of the farm tractor business in 1918 said that if one farmer out of every 40 bought a tractor this year—which was regarded as a conservative estimate—would keep all of the tractor plants busy up to their capacity. However, the farmer has not bought, being impressed no doubt with that spirit of hesitancy which has afflicted many buyers. Probably the farmer is waiting for lower prices. At any rate he has not taken hold of the tractor proposition in the way he was expected to.

Machine tool plants at Madison, Wis., are still closed on account of a machinists' strike. The machinists at Rockford, Ill., threaten to walk out in sympathy with furniture workers who have been on a strike for some time.

Building permits issued in Chicago in April are nearly double the number issued in the same month a year ago and also somewhat in excess of those issued in April, 1917, the figures being 705 for April, 1919, 396 for April, 1918, and 652, April, 1917. Of the permits issued last month 512 were for residences, 42 for apartments and 131 for business structures.

The Wisconsin Steel Co., Chicago, has awarded contracts for the construction of brick and steel coal bins and conveyors, 42 x 58 ft., 116 ft. high, a four-story coal crushing plant, 37 x 54 ft., and a one-story shelter, 49 x 76 ft., for unloading coal into track hoppers, at 106th Street and Torrence Avenue. The total cost is \$110,000.

The Standard Galvanizing Co., Chicago, has purchased a tract, 200 x 305 ft., in Fifty-fourth Avenue near Twenty-second Street. The company does not plan to improve the property immediately.

The Peter Brothers Mfg. Co., Algonquin, Ill., manufacturer of tapping and abrasive metal cutting machines, is preparing plans for an addition to its plant, 45 x 185 ft.

The White Lily Mfg. Co., Davenport, Iowa, manufacturer of washing machines, will erect an addition, 20 x 225 ft., a warehouse, 25 x 30 ft., and seven auxiliary buildings, 25 x 30 ft. each. A contract has been let for part of the improvements planned, which altogether will cost \$150,000.

The Minneapolis Steel & Machinery Co., Minneapolis, Minn., has been granted a permit for the construction of a warehouse at 3220 Snelling Avenue, to cost about \$58,000.

The Nebraska & Iowa Steel Tank Co., Omaha, Neb., contemplates building a one-story, 120 x 225-ft. plant at an estimated cost of \$50,000.

The Titchener-Diehl Co., 902 West Lake Street, Chicago, will move May 1 to a new factory building at 1844 Austin Avenue. It will continue to manufacture wire staples and miscellaneous wire shapes, such as hooks, rings, handles. Harvey Diehl, manager, will remain in charge. This company is closely affiliated with E. H. Titchener & Co., Birmingham, N. Y.

Carl Gunterson, 1127 North Laramie Avenue, Chicago, will build a one-story foundry, 24 x 50 ft., at 5451 Haddon Avenue, to cost about \$50,000, including equipment.

The California Ice Co., Chicago, has filed plans for the construction of a new one-story plant at 2200-44 South Crawford Avenue, to cost about \$60,000.

The Staley Mfg. Co., Decatur, Ill., is considering plans for the erection of a power plant addition.

Samuel Schmidt, 162 North Desplaines Street, Chicago, manufacturer of sheet metal products, is taking bids for the erection of new works at 1918 West Lake Street, to cost about \$30,000.

The Atchison, Topeka & Santa Fé Railroad, Chicago, is said to be planning for the rebuilding of the portion of its car shops on West Thirty-fifth Street, recently destroyed by fire with loss in excess of \$40,000.

Mathias Klein & Sons, 562 West Van Buren Street, Chicago, manufacturers of metal specialties, are planning for the erection of a new one-story machine shop, 80 x 160 ft., at 3236 Belmont Avenue.

The Modern Pattern Shop, Thirtieth Avenue, South, Minneapolis, Minn., has completed plans for the construction of a new one-story and basement pattern works on Snelling Avenue, 40 x 70 ft.

The Sumner Engine Co., Fairmont, Minn., is taking bids for the erection of a new plant, to include a main one-story works, 50 x 250 ft., with storage building, 40 x 90 ft., and office building, 25 x 40 ft. Carl H. Brodt is president.

## Cleveland

CLEVELAND, May 5.

Machinery houses did a good volume of business the past week in small lot orders from automobile manufacturers in this and the Detroit sections. There is a very active demand from this field for milling machines and cylindrical grinders, but lathes are moving slowly. A fair volume of business is coming from Akron rubber manufacturers. The Goodyear Tire & Rubber Co. is inquiring for several machines and it is reported will purchase about 20 in all. The Liberty Steel Co., Warren, Ohio, has issued a list for 13 machine tools. Inquiry for cranes has become more active.

Cleveland shops that furnish tractor parts for Henry Ford & Son, Dearborn, Mich., have been advised that the

plant, which has been shut down for several weeks, will resume operations shortly at a much increased capacity, and deliveries of forgings and other parts in larger quantities will be required.

The J. D. Fate Co. and the Root-Heath Mfg. Co., Plymouth, Ohio, have consolidated under the name of the Fate-Root-Heath Co. The new organization has not yet been perfected. The combined plants will be enlarged by the erection of a foundry, 120 x 180 ft., two-story warehouse, 40 x 180 ft., an addition to the power plant and a two-story office building, 60 x 60 ft. The contract for the buildings has been placed with the Ferguson Co., Cleveland, and with equipment will involve an expenditure of \$200,000. The Fate company manufactures industrial locomotives and clay working machinery, and the Root-Heath company various products, including lawn mower sharpeners.

The Post Tractor Co., 815 Society for Savings Building, Cleveland, will occupy under lease a factory, 70 x 200 ft., which it expects to have completed early in the summer. It will be used for assembling, and equipment now in its plant in Greenwich, Ohio, will be moved to Cleveland. Probably a small amount of machinery will be required.

The Urbana Tool & Die Co., Urbana, Ohio, recently incorporated with a capital stock of \$150,000, will conduct the business that has been carried on by a partnership under the same name. James K. Cheetham is president; Joseph K. Cheetham, secretary-treasurer, and R. C. McDonald, general manager. The company manufactures jigs, fixtures, dies, etc.

The shell plant of the Hydraulic Pressed Steel Co., Cleveland, which was built as a separate unit to increase the company's production of shells for the Government, according to present plans will be turned over shortly by the Government to the Hydraulic Steelcraft Co., which is affiliated with the Hydraulic Pressed Steel Co. Presses and other shell-making equipment which belong to the Government will be removed and new equipment will be installed for the manufacture of forms for concrete work, the fabrication of bars used in building and other building products.

The Nickel Plate Foundry Co., Cleveland, of which R. P. Chamberlain, 948 Engineers' Building, is secretary, has taken bids for the construction of a foundry, 74 x 169 ft.

The Central Brass Mfg. Co., Cleveland, has increased its capital stock from \$150,000 to \$210,000 as part of reorganization plans which have been completed, and announcement of which will be made shortly.

The Ferry Cap & Set Screw Co., Cleveland, will erect a three-story brick and steel extension which will be built over an existing one-story building covering an area, 48 x 170 ft. Ernest McGeorge, Euclid Building, is the engineer.

The plant of the Hist Potato Machinery Co., Alliance, Ohio, has been purchased by the Cleveland Implement Mfg. Co., which has been recently incorporated with a capital stock of \$500,000. F. B. Moodie is president and general manager; George H. Burroughs, vice-president, and C. F. Young, secretary.

The Cleveland Rubber Mold & Machine Co., Scofield Building, recently incorporated, expects to be in the market shortly for equipment for making tire molds and cores.

The Liberty Steel Co., Warren, Ohio, is in the market for two lathes, a shaper, planer, radial drill, bolt cutter, pipe threading machine, drill press, grinder, and three wood-working machines.

The East End Machine Co., Akron, Ohio, has about completed the erection of a plant which will be used for the manufacture of tire molds and cores. Equipment has been purchased.

The Rollway Mfg. Co., Toledo, Ohio, has been incorporated with a capital stock of \$300,000 by Walter Stewart, formerly with the Willys-Overland Co., and others to manufacture bicycle motors.

The Toledo Pressed Metal Co., Toledo, has been organized to manufacture metal stampings, and it is stated plans to take over the press and other equipment that was used by the Toledo Bridge & Crane Co. during the war for making shells.

The French Oil Mill Machinery Co., Piqua, Ohio, has placed a contract for the construction of a one-story assembling plant, 96 x 142 ft. It has also placed an order with the Pawling & Harnischfeger Co., Milwaukee, for a 10-ton traveling crane.

The Kaufman Metal Parts Co., Bellefontaine, Ohio, is planning the erection of a one-story factory, 50 x 100 ft.

The United States Steel Grave Vault Co., Gallon, Ohio, has been organized with a capital stock of \$15,000 and has acquired the plant of the Gallon Brass Foundry Co. W. T. Resch is president and L. E. Place, secretary-treasurer.

## Cincinnati

CINCINNATI, May 5.

The automobile and tractor industries are placing some small orders for machine tools, but only for one to three at a time. The general reduction in prices has brought out little if any new business. One reason for the hesitancy on the part of some buyers is said to be that they are waiting to see what the Government will do with the large number of machine tools held in different parts of the country. However, there seems to be no fear now that these machines will be dropped on the market indiscriminately. The railroads are buying nothing in the way of machine tools.

Export business shows a little improvement in some quarters and it is believed that quite a number of foreign inquiries in hand will develop into orders before very long. The ocean freight rate question continues a very important one, and there does not seem to be any sign for an early adjustment of rates on a more equitable basis. The removal of restrictions on shipments to England has had a favorable effect, but has not resulted in any new business.

Wood-working machinery manufacturers, as well as makers of metal forming equipment, report business as only fair, but a number of large sized deals are in hand that may develop into orders at an early date.

The Standard Electric Tool Co., Cincinnati, has completed the removal of its machinery to its new plant at York Street and Western Avenue.

The Rapid Electrotpe Co., Cincinnati, is having plans prepared for a new plant on McMicken Avenue. It will be used to manufacture electrotypes. A power plant will be equipped.

The Martin Lingler Coal Co., Hamilton, Ohio, will erect a tile factory on East High Street. It is reported that most of the machinery has been purchased.

The Dimler-Hines Tool Co., Dayton, Ohio, has increased its capital stock from \$10,000 to \$20,000. The capacity of its plant will be increased at an early date. W. J. Dimler is president.

The Burkitt Closed Body Co., Dayton, recently incorporated, has taken out a permit for a factory to be erected at 2307 West Third Street. It will manufacture automobile bodies.

The addition to the plant of the French Oil Mill Machinery Co., Piqua, Ohio, recently mentioned as contemplated, will be one story, 96 x 142 ft., of fireproof construction. It is buying some second-hand machine tools.

The Allen Motor Car Co., Columbus, Ohio, has almost completed removing the machinery from its former plant at Fostoria, Ohio, to its new home at Columbus.

It is rumored that the Greenville Mfg. Co., Greenville, Ohio, will make an addition to its general machine shop at an early date.

## Philadelphia

PHILADELPHIA, May 6.

While many inquiries are pending which prospective buyers show no haste to act upon, there is a slight improvement in machine-tool business in this market. Machine-tool sellers see a good trade ahead when the ball starts rolling. The only important buying of the past two weeks has been done by the North American Motors Corporation, Pottstown, Pa., which is engaged in motor work, but other small purchases have been made by companies whose requirements are still only partially satisfied.

The American International Shipbuilding Corporation has issued an inquiry for 400 tools and 100 electric motors for machine shops on merchant ships. Its list calls for 100 9-in. or 14-in. shapers, 100 16-in. lathes, 100 20-in. upright drills and 100 10-in. grinders. The Merchant Shipbuilding Corporation, Bristol, Pa., recently issued a similar inquiry for 20 sets of tools for ships, but has not yet bought.

The Camden Mfg. Co., Camden, N. J., manufacturer of thread chasers, will build a new shop, for which machine-tool equipment is being purchased. The Lycoming Foundry & Machine Co., Williamsport, Pa., will increase its machine-shop equipment for the manufacture of Dort automobile motors. The Wright Roller Bearing Co., Philadelphia, and the Nice Ball Bearing Co., Philadelphia, have been adding a small quantity of new equipment. The Standard Pressed Steel Co., Philadelphia, is in the market for a list of equipment.

The Navy Department is getting bids on tools for machine shops for new battleships. The War Department is equipping its arsenal at Amato, N. J., for the manufacture of ordnance by transferring tools from other war plants. Capt. L. E. Walker is in charge of machinery at the Amato arsenal.

Considerable railroad buying is in prospect but railroad purchasing departments and engineers are awaiting word from the Railroad Administration to go ahead.

Second-hand machinery from war plants is making its appearance in the local market, the largest offering coming from the Eddystone Munitions Co., Eddystone, Pa., which is selling its entire equipment of several hundred tools. Charles Reartek is sales agent in charge of machinery disposal. The tools are said to have an appraisal value of about \$1,500,000 and include approximately 180 Bridgeford lathes, 100 Gisholt turret lathes, 37 Niles-Bement-Pond lathes, 32 Pittsburgh lathes, about 80 Pottstown lathes and 20 American lathes.

The Bureau of Yards and Docks, Navy Department, Washington, has had plans prepared for a new aircraft building at the naval works, Philadelphia, to cost about \$250,000.

The American Bridge Co., Widener Building, Philadelphia, has commenced the erection of a pattern shop at the Pencoyd Iron Works plant, Pencoyd.

The Keystone Stamping Device Co., Philadelphia, has leased property at 27 South Ninth Street for a new local establishment.

The William Cramp & Sons Ship & Engine Building Co., Beach and Ball Streets, Philadelphia, is building a blacksmith shop and coppersmith shop to replace the structures destroyed by fire some time ago, providing increased and better facilities. It is also installing four 15-ton bridge cranes and runways. About 10,000 men are now employed.

The O. J. Maigne Co., 1017 Sansom Street, Philadelphia, manufacturer of printers' rollers, etc., has awarded a contract to Dodge & Morrison, New York, for extensions on Hutchinson Street to cost \$15,000.

The John A. Roebling's Sons Co., Trenton, N. J., manufacturer of wire rope, cable, etc., will build a one-story addition to its machine shop on South Broad Street, 31 x 53 ft.

Plans are under way for a new electric power plant at the Juniata College, Huntingdon, Pa., by the Board of Trustees. It is estimated to cost about \$25,000. G. Edwin Brumbaugh, Real Estate Trust Building, Philadelphia, is architect.

The Kuebler Foundries, Inc., Easton, Pa., specializing in the production of iron and steel castings, will build a one-story addition 52 x 115 ft., to cost \$15,000.

Machine equipment and repair facilities will be installed in the new buildings to be established by the Miller Auto Co., 58 South Cameron Street, Harrisburg, Pa. The company has acquired a structure at Ninth and Cumberland Streets, Lebanon, to be immediately remodeled for an automobile works, while a second building has been purchased at Mechanicsburg for a like purpose. B. F. Barker is manager.

The Tacony Steel Co., Tacony, Philadelphia, has just completed a 150-ft. extension to its main press shop.

## St. Louis

ST. LOUIS, May 5.

Newberger & Rankin, New Orleans, La., and Newberger & Taylor, Memphis, Tenn., have plans for the installation of additional compresses and other cotton handling equipment at various Louisiana towns. They operate 21 plants.

The Hollandale Gin Co., Hollandale, Miss., has been incorporated by C. D. Walcott, J. B. Drew, E. E. McKinney and others and will equip a cotton compress, including oil engine and other machinery.

The Helena Cotton Oil Co., Helena, Ark., capital \$200,000, S. Straub, president; E. B. Burke, secretary-treasurer, will install equipment for the manufacture of cottonseed products, including presses, power plant, etc.

The Ashdown Light & Power Co., Ashdown, Ark., will rebuild its plant recently burned, requiring about \$35,000 worth of machinery.

The Clarksville Electric Light & Water Co., Clarksville, Mo., will install electric light and waterworks plant equipment under a municipal franchise.

An electric light plant to cost about \$75,000 will be established at Silkeston, Mo. The mayor, C. C. White, is in charge.

Swift & Co., Chicago, Ill., will equip an addition to their plant in St. Louis, requiring about \$70,000 worth of machinery.

J. E. Busch and others, Cherokee, Okla., will install an electric light plant to supply current to Cherokee and surrounding towns and also for commercial purposes. Address Box 416.

The Town Council, Norman, Okla., has voted \$125,000 in

bonds for the equipment of a municipal electric light and power plant. Address the mayor.

The town of Tishomingo, Okla., has voted \$50,000 for the purchase of electric light plant equipment.

The Liberty Milling Co., Kansas City, Mo., is reported in the market for about \$20,000 worth of machinery.

The Ajax Brass Co., St. Louis, will equip a brass and aluminum casting foundry at 4052 Cozzens Avenue.

The Busch-Sulzer Bros. Diesel Engine Co., St. Louis, has let a contract to the Austin Co. for the construction of a foundry to make castings for Diesel engines of the largest type. The crane runway of the plant will also be remodeled.

The Montrose Oil Refining Co., Shreveport, La., capital \$300,000, W. R. Spann, E. R. Ratcliff and others interested, will equip an oil refinery at Shreveport.

The Bigheart Producing & Refining Co., Bigheart, Okla., will install equipment to increase its output from 1200 to 4000 bbl. per day.

The New Era Refining Co., Olton, Okla., capital \$300,000, will equip an oil refinery with a daily capacity of 2500 bbl.

The Arkansas Hydroelectric Development Co., Heber Springs, Ark., Dickinson & Watkins, Little Rock, Ark., engineers, will resume plans for hydroelectric development to cost about \$5,000,000 interrupted by the war. The initial unit will develop 2000 kw. and the second about 10,000 kw.

The town of Tahlequah, Okla., will equip a hydroelectric plant on the Illinois river, Oklahoma, near Tahlequah, to develop about 1000 kw. for municipal and commercial purposes.

The Beggs Power & Ice Co., Beggs, Okla., will equip a \$100,000 plant. W. H. Reading and C. C. Kimble are interested.

Howard Eggleston, manager of the New Orleans Industrial Bureau, has plans for a rolling mill plant of 48,000 tons annual capacity to cost about \$250,000, to utilize scrap material chiefly.

The Columbia Taxicab Co., St. Louis, will erect a repair plant and garage for its own use to cost about \$100,000. Machine shop equipment will be needed.

McComb, Miss., will expend about \$50,000 on its waterworks plant. B. E. Butler is city clerk.

The International Shipbuilding Co., Gulfport, Miss., will increase its capital from \$200,000 to \$1,000,000 and install additional machinery and other equipment.

Hattiesburg, Miss., will expend \$60,000 for improving its waterworks plant.

The R. & V. Wagner Ordnance Co., St. Louis, has increased its capital from \$400,000 to \$1,750,000.

The John Deere Plow Co., Moline, Ill., will build a one-story and basement addition to its plant at Kansas City, Mo., 67 x 125 ft.

A new one-story and basement boiler plant will be erected by the Board of Trustees, Halstead Hospital, Halstead, Kan., to cost about \$25,000. Dr. A. E. Hertzler, 1310 Rialto Building, Kansas City, Mo., is in charge.

Leistner & Sons, St. Charles, Mo., will build a new one-story and basement machine shop and foundry, 48 x 60 ft., and 15 x 30 ft., respectively. Fred Leistner is head.

The Miles Piston Ring Co., Memphis, Tenn., has been incorporated with a capital of \$50,000 by Charles H. Miles, Charles Hudson and C. K. Fuller, to manufacture piston rings and other specialties.

## Indianapolis

INDIANAPOLIS, May 5

The Appliance Mfg. & Distributing Co., Logansport, Ind., will move to Peru, Ind., following an agreement made with the Peru Chamber of Commerce. It manufactures electric heaters and other electrical appliances.

The Roberts Axle Truck & Tractor Co., Anderson, Ind., has been incorporated with \$50,000 capital stock. The directors are Joseph W. Jackson, Lamente E. Jones and Orville W. Roberts.

The Power Supply Co., Terre Haute, Ind., has increased its capital stock from \$60,000 to \$120,000.

The Varney Electrical Supply Co., Indianapolis, has increased its capital stock from \$150,000 to \$280,000.

The McGill Metal Co., Valparaiso, Ind., has increased its capital stock from \$100,000 to \$200,000.

The Capital Furniture Mfg. Co., Noblesville, Ind., has increased its capital stock from \$50,000 to \$100,000.

The Gladstone Coal Co., Petersburg, Ind., will install

motors and build a tippie at its mine three miles east of the city.

The Union City Wheel Works, Union City, Ind., will build a two-story addition to its plant, 50 x 70 ft. Plans have been prepared.

The Remy Electric Co., Anderson, Ind., has leased a building 30 x 80 ft., formerly occupied by the Lavelle Foundry Co., which will be utilized as a temporary tool room and storage house. Machinery is being moved into the new five-story addition to its factory.

## The Pacific Coast

SAN FRANCISCO, April 29.

While there has been no official intimation that Pacific Coast ship yards will be affected by the recent cancellation of 2,000,000 tons of steel ships by the Government, many shipbuilders fear that some of their contracts will be affected. One large engine company is reported to have had all of its Government contracts canceled except the engines upon which actual construction has begun. This was followed by the cancellation of castings and other partially wrought materials which the company had ordered from shops outside its own establishment and as a consequence former good sized buyers of machinery are now out of the market. The small shops, whose business is in no way connected with shipbuilding are still prosperous and continue to buy individual machine tools which in the aggregate amount to a considerable volume. New garages are being built every week, and for these there is a constant demand for lathes and other machinery. The automobile industry is one of the most flourishing in the State, and the rapid increase in the number of automobile sales is the cause of the increase in repair shops.

The industrial situation, particularly in the Puget Sound section, is showing a very encouraging improvement and the past two weeks have seen a marked increase in activity. Several big enterprises are completing plans for immediate extensions and installation of new equipment and a real revival, almost a boom, is noted in the demand for industrial sites.

The Railroad Administration has recently placed with Northwest lumber manufacturers an order for 2,000,000 ties, valued at \$1,750,000, for roads east of Chicago, which is expected will have a material effect in strengthening the lumber market.

The American Brake Shoe & Foundry Co. of California, a subsidiary of the Delaware corporation, has closed a long time lease of the plant of the Enterprise Foundry Co., San Francisco, which will be enlarged to manufacture the brake-shoes required for the equipment of new railroads that are projected in China, as well as for the trans-Siberian system and other railroad enterprises in foreign countries bordering on the Pacific.

Actual construction of the factory of the Kroyer Tractor Co., Stockton, Cal., is to begin about June 1. It will manufacture a line of tractors to be known as the four-pull tractor. The company was recently formed with a capital of \$5,000,000 subscribed chiefly by Stockton people. J. M. Kroyer is president.

The Eureka Mfg. Co., Monrovia, Cal., is installing new machinery in a building just leased where it will manufacture air brakes and engines. It is incorporated with \$150,000 capital and the officers are Dwight Brooks, president; M. E. Stockwell, vice-president, and W. D. McConnell, secretary-treasurer.

The local Material Disposal Section of the Aircraft Production Board, San Francisco, is advertising for sale a large supply of machine tools, including drills, lathes, shapers, turrets, milling machines, etc.

J. N. S. Johnson, San Francisco, is building a concrete garage and repair shop on California near Powell Street to cost \$28,000.

C. H. Curtaz, San Francisco, is building a one-story concrete machine shop for automobile repair work on Turk near Van Ness Street, to cost \$25,000.

The Machinery Sales Agency, a subsidiary of the Western Machine Co., Seattle, has opened offices at 593 Market Street, San Francisco, under the management of J. P. Keller, for the sale of mining, milling and other machinery and railroad equipment.

The Reedsport Light & Power Co., Reedsport, Ore., will equip an electric light plant at that place.

The Beaver River Lumber Co., Jackman, B. C., has announced its intention of immediately starting work of rebuilding its sawmill and lumber plant recently destroyed by fire with a loss of \$75,000.

The Hofius Steel & Equipment Co., Seattle, has purchased a site on First Avenue South on which its plant will be

located, augmented by additions. It is stated that \$100,000 will be spent in buildings and equipment.

The Ames Shipbuilding & Drydock Co., Seattle, has started construction of the first two pontoons of an 18,000-ton drydock, which will be built at the company's shipyard. A total of six pontoons will be built, each to have lifting capacity of 3000 tons. Electric driven pumping apparatus will be installed. T. A. D. Jones is general manager.

The Motor Shingle Mill Company, Seattle, plans the expenditure of \$3,000 immediately for additions to the plant including increased dry kiln facilities.

The Valley Packing Co., Salem, Ore., plans the construction of a plant in that city to cost about \$130,000 with buildings and equipment.

The American Pipe & Shipbuilding Co., Bryn Mawr, near Seattle, has changed its name to the L. Y. Stayton Co. and plans the immediate construction of a reinforced concrete factory, 80 x 140 ft., for manufacturing concrete pipe. Mixers and other equipment will be installed. The plant will have a daily capacity of one mile of pipe.

## Texas

AUSTIN, May 2

The Markham Irrigation Co., Bay City, which recently increased its capital stock from \$250,000 to \$340,000, will enlarge its canal system and pumping plant.

The Gonzales Water Power Co., Gonzales, will increase the capacity of its hydro-electric plant by installing additional machinery to cost about \$80,000.

The Moore Iron Works, El Paso, has been incorporated with a capital of \$25,000 by F. B. Moore, H. E. Christie and E. C. Helbuhr, all of El Paso.

The city commission, San Angelo, is having a survey made for a proposed municipal electric light and waterworks plant which it contemplates building at a cost of about \$500,000.

A. J. Nixon and W. P. Durbin, Vernon, plan to build an oil refinery at Dublin to cost about \$750,000.

## Canada

TORONTO, May 5

Machinery dealers are doing a fair volume of business, but expect a considerable increase in the near future. A number of concerns have mapped out their programme of manufacture and will shortly be in the market for a substantial amount of equipment. The motor car industry will be one of the leading factors in the betterment of the machinery market, as many new plants are under construction and plans are in preparation for others in Windsor, Walkerville, Hamilton and Toronto. Another source of new business is the Canadian National Railways, which continues to send out large lists of specifications. This company is spending millions of dollars on equipment and rolling stock, and it will be some time before all of its requirements are filled. Mining companies in northern Ontario, which have not been recent purchasers of equipment, are now taking an added interest in the machinery markets and are spending vast sums for betterment.

The E. Long Mfg. Co., Orillia, Ont., having completed its adjustments with the Imperial Munitions Board, arising out of shell-making activities, is now turning its attention to peace-time manufacture. The company has about 25 men at work dismantling and removing shell machinery and installing new equipment, with a view to resuming the manufacture of saw mill and mining machinery. Some of the shell equipment will be adapted to the new purpose, but most of the machinery will be new.

The Nukol Fuel Co., Ltd., 24 John Street North, Hamilton, Ont., will build a factory to cost \$40,000.

Bids will be called shortly for the erection of a factory at London, Ont., for the Republic Motor Truck Co., to cost \$500,000. B. Jones, 76 Church Street, Toronto, is the representative.

Plans are being prepared for the erection of a factory at Montreal for the Dominion Carriage Co., Ltd., Sherbrooke, Que., to cost \$90,000. J. W. Gregoire, Sherbrooke, is the architect.

Plans are being prepared and bids will be called immediately for the erection of a \$50,000 foundry at Sarnia, Ont., for the Romeo Foundry Co., Port Huron, Mich. Prices are wanted on material and equipment.

Dodge Brothers, Luhsden Building, Toronto, will build a factory in this city to cost about \$60,000. E. P. Clarkson is representative.

The Hamilton Gear Co., Ltd., Toronto, has been incorpo-

with a capital stock of \$300,000 by George E. McCann, 49 Wellington Street East; Francis A. Hammond, 610 Ontario Street; Arthur F. Ball and others, to take over the business and plant of the Hamilton Gear & Machine Co., 15 Van Horn Street, to manufacture machinery, tools, etc.

The Raymer Mfg. Co., Ltd., Toronto, has been incorporated with a capital stock of \$150,000 by James M. Forgie, 48 South Drive Avenue; William B. Sturup, 6 Adelaide Street East; Thomas S. H. Giles and others to manufacture tools, buckles, hardware, machinery, etc.

The Abrasive Wheel & Pulp Stone Co., Ltd., Mohawk, Ont., has been incorporated with a capital stock of \$40,000 by George B. Battye, Matthew F. Muir, Jean Charlesworth and others, all of Brantford, Ont., to manufacture hones, emery and carborundum wheels and all kinds of abrasive stone, etc.

Taylor-Wilkie, Ltd., Sandwich, Ont., has been incorporated with a capital stock of \$250,000 by Norman Taylor, Lorne A. Wilkie, James D. Wilkie and others, all of Windsor, Ont., to manufacture automobiles, engines, motors, etc.

The Dixon Motors, Ltd., Ottawa, has been incorporated with a capital stock of \$100,000 by James R. Dixon, George D. Kelley, Allan J. Fraser and others to manufacture automobiles, trucks, flying machines, machinery, etc.

Plans are being prepared and bids will be called at an early date for the erection of a plant for the Four Wheel Drive Auto Co., Kitchener, Ont., to cost \$200,000. W. C. Cowan, 430 King Street East, is the architect.

N. A. McRae and Bliss Y. Hicks, Petittcodiac, N. B., will build a blacksmith shop and wood-working factory to cost about \$40,000.

T. Brock, Wyoming, Ont., will build an auto repair shop to cost \$5,000, and is asking for prices on equipment.

The F. E. Partridge Rubber Co., Ltd., Metcalfe Street, Guelph, Ont., has let the general contract to P. H. Secord & Son, 133 Nelson Street, Brantford, Ont., for the erection of a factory to cost \$40,000.

Lachance, Ltd., 99 Dalhousie Street, Québec, is in the market for a locomotive crane of 10- or 15-tons capacity, handling 1-yd. bucket.

The Beaverton Top Co., Ltd., Beaverton, Ont., is in the market for a belt sander and automatic wood-turning lathe.

The J. C. Wilson Mfg. Co., Ltd., Belleville, Ont., has been incorporated with a capital stock of \$200,000 by Fred S. Wilson, Harry A. Wilson and others to manufacture metal castings and to carry on a general foundry and machine shop business.

The Chase Tractor Co., Ltd., has taken over the plant of the Cluff Ammunition Co., 28 Atlantic Avenue, Toronto, and will commence at once to equip it for the manufacture of motor tractors, etc. It will be used as temporary premises as a plant at the foot of Cherry Street will be erected as soon as business conditions warrant. R. J. Cluff is president.

The Stickney Motors, Ltd., Peterboro, Ont., has been incorporated with a capital stock of \$1,500,000. Charles A. Stickney is president and G. N. Gordon solicitor. The company has purchased the building formerly occupied by the Canadian Cordage Co., which it will at once put in readiness to manufacture farm tractors, motor trucks, gasoline engines, etc.

According to S. A. Mundy, Bradford, Pa., president of the Spruce Falls Pulp & Paper Co., the erection of a large paper mill will be started this month at Kapuskasing, near Cochrane, Ont. While the contract for the erection of the plant has not been closed, satisfactory arrangements have been settled with the contractors.

The Automobile Service & Construction, Ltd., Montreal, has been incorporated with a capital stock of \$50,000 by Horace J. Gagne, Roch T. Beaudoin, Leonce Plante and others to manufacture motor vehicles, machines, airplanes, etc.

The plant of the Canada Wire & Cable Co., at the corner of Chelsea and Dundas streets, Toronto, was totally destroyed by fire April 27. The loss will amount to about \$200,000, including the machinery. It is understood that the company was shortly to remove all its equipment to the new plant at Leaside, Ont., and will now be under the necessity of making new purchases.

The E. Laurie Co., 243 Bleury Street, Montreal, has been awarded the general contract for the erection of a \$150,000 plant at Three Rivers, Que., for the Page Wire Fence Co., Ltd., 505 Notre Dame Street West, Montreal.

The York Sandstone Brick Co., East Toronto, is in the market for an 18 x 72 return tubular boiler, 150 hp.

The Henry Engineering Co., 71 Bay Street, Toronto, is in the market for electric motors.

J. Hayne, Sarnia, Ont., is in the market for a 60- to 75-hp motor.

## NEW TRADE PUBLICATIONS

**Electrical Appliances.**—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Catalog. Contains 1264 pages devoted largely to a description of the company's output of electrical appliances. A complete cross index, an index to style numbers, and a table of approximate cost multipliers, which enables one to figure the approximate cost of all supplies listed, are included. It contains considerable information of a technical and engineering nature including practical suggestions for the use of many kinds of apparatus for the transmission and utilization of electric power.

**Safety and First Aid Supplies.**—Safety Service and Supplies Co., Chicago. Catalog. Devoted to a line of accident prevention devices, first aid supplies, fire fighting apparatus and sanitary equipment. The items illustrated and described include signs, charts, goggles, masks, gloves, machine guards, first aid operating room supplies, first aid cabinets, fire extinguishers, etc.

**Steam Jet Air Pump.**—Wheeler Condenser & Engineering Co., Carteret, N. J. Bulletin 113. Illustrates and describes a steam jet air pump having the feature of two or more steam jets working in series with a condenser between the jets. Cross section views are shown and the operating principles are explained. Included are a single machine for 2000-kw. surface condenser, a double machine for 5000-kw. surface condenser, and a triple machine for 20,000-kw. surface condenser. The pump is applicable to jet condensers, as well as to surface condensers.

**Portable Supply Tanks.**—C. C. Fouts Co., Middletown, Ohio. Pamphlet. Describes portable supply tanks made of "Duro Copper Iron," finished with black enamel. Designed for mounting on wagon gears, trailers or runabouts. The tanks are made in four capacities, ranging from 155 to 500 gal.

**Superheaters.**—Locomotive Superheater Co., 30 Church Street, New York. Bulletin T 1. Concerned with superheaters for stationary power plants. The construction, and operation of the superheaters is described, and an assembled and detailed views are shown. Cross section views are included showing the typical arrangement of the superheater for vertical water tube boiler, for cross drum type boiler, for horizontal return tubular boiler, and for horizontal water tube boiler.

**Parts Produced From Tubing.**—Maxim Silencer Co., Hartford, Conn. Folder. Shows examples of the various complicated parts which the company is prepared to produce from steel tubing.

**Electric Lift Trucks.**—Leece-Neville Co., Cleveland. Leaflet. Describes a truck with a motor for propelling the truck and lifting the platform. Views of the truck in service are given.

**Portable Electric Drills.**—Black & Decker Mfg. Co., Baltimore. Folder. Devoted to a description of the company's line of portable electric drills with pistol grip and trigger switch, made in various sizes.

**Steam Engine.**—Ingersoll-Rand Co., 11 Broadway, New York. Form 9026. Concerned with a high speed, piston valve steam engine of the horizontal, center crank type. The cylinder is bolted to a heavy, rigid main frame inclosing the crank, cross-head, connecting rod and bearings, and mounted on a substantial sub-base. All running parts but the fly wheels are completely inclosed. Details of parts as well as an assembled and a longitudinal cross-section view of the engine are shown.

**Vises and Tools.**—Athol Machine Co., Athol, Mass. Catalog 32. Devoted largely to a description of an extensive line of vises of various types, also a quick adjustable wrench, household grindstone and grindstone frames, bench grinders, etc. The various articles are illustrated.

**Flat-Split Keys.**—Bettcher Stamping & Mfg. Co., Cleveland. Loose-leaf catalog. Shows in full-sized illustrations with dimensions, 60 flat-split keys of various forms and sizes, covering all keys of this type made by the company up to this time. The keys are furnished either riveted or spot-welded as desired, but attention is called to the fact that many prefer the spot-welded keys, as they are lighter than the riveted keys and equally as dependable.

**Overhead Cranes.**—Champion Engineering Co., Kenton, Ohio. Bulletin 106. Describes in detail the company's electric overhead crane, the salient features of which are given as simplicity, safety, accessibility, and interchangeability of parts. The crane is designed to meet the requirements usually called for by steel mill crane specifications. The illustrations show various parts of the crane and typical installations.

# Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

## Iron and Soft Steel Bars and Shapes

Per lb.

### Bars:

Refined iron, base price	3.37c
Burden's H. B. & S. bar iron, base price	6.30c
Burden's best bar iron, base price	6.50c
Swedish bars, base price	20.00c

### Soft Steel:

¾ to 1½ in., round and square	3.37c
1 to 6 in. x ¾ to 1 in.	3.37c
1 to 6 in. x ¾ and 5/16	3.47c

Rods—¾ and 11/16	3.42c
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Bands—1½ to 6 x 3/16 to No. 8	4.07c
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### Shapes:

Beams and channels—3 to 15 in.	3.47c
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### Angles:

3 in. x ¾ in. and larger	3.47c
3 in. x 3/16 and ¼ in.	3.72c
1½ to 2½ in. x ¾ in.	3.52c
1½ x 2¾ in. x 3/16 in. and thicker	3.47c
1 to 1¼ in. x 3/16 in.	3.52c
1 to 1¼ in. x ½ in.	3.57c
¾ x ¾ x ¾ in.	3.62c
¾ x ¾ in.	3.67c
¾ x ¾ in.	4.47c
½ x 3/32 in.	5.17c

### Tees:

1 x ¾ in.	3.87c
1¼ in. x 1¼ x 3/16 in.	3.77c
1½ to 2½ x ¾ in.	3.57c
1½ to 2½ x 3/16 in.	3.57c
3 in. and larger	3.52c

## Merchant Steel

Per lb.

Tire, 1½ x ½ in. and larger	3.37c
Toe calk, ½ x ¾ in. and larger	4.72c
Open-hearth spring steel	6.00c
Standard cast steel, base price	14.00c
Extra cast steel	18.00 to 20.00c
Special cast steel	23.00 to 25.00c

## Tank Plates—Steel

Per lb.

¾ in. and heavier	3.67c
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## Sheets

### Blue Annealed

Per lb.

No. 8 and 3/16 in.	4.52c
No. 10	4.57c
No. 12	4.62c
No. 14	4.67c
No. 16	4.77c

## Box Annealed—Black

Soft Steel C. R., One Pass, per lb. Wood's Refined, per lb.

Nos. 18 to 20	5.17c	6.95c
Nos. 22 and 24	5.22c	7.00c
No. 26	5.27c	7.15c
No. 28	5.37c	
No. 30	5.57c	
No. 28, 36 in. wide, 10c higher.		
Wood's Keystone Hammered, 18-24 gage, 9¾c; 26-28 gage, 10¼c.		

## Galvanized

Per lb.

No. 14	5.60c
No. 16	5.75c
Nos. 18 and 20	5.90c
Nos. 22 and 24	6.05c
No. 26	6.20c
No. 27	6.35c
No. 28	6.50c
No. 30	7.00c
No. 28, 36 in. wide, 20c. higher.	

## Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

## Steel Wire

BASE PRICE\* ON NO. 9 GAGE AND COARSE

Bright basic	5.25c
Annealed soft	5.25c
Galvanized annealed	6.00c
Coppered basic	6.00c
Tinned soft bessemer	7.25c

\*Regular extras for lighter gages.

## Brass Sheet, Rod, Tube and Wire

BASE PRICE

High Brass Sheet	20c	to 21¼c
High Brass Wire	20c	to 21¼c
Brass Rod	19c	to 20¼c
Brass Tube	30¼c	to 35c

## Copper Sheets

Sheet copper, hot rolled, 16 oz., 22½c. to 25c. per lb. base.  
Cold rolled, 14 oz. and heavier, 1c. per lb. advance over hot rolled.

## Tin Plates

Bright Tin

Coke—14x20

Grade "AAA"	Grade "A"	Primes	Wasters
Charcoal 14x20	Charcoal 14x20	80 lb. ... \$8.30	\$8.05
IC .. \$11.30	\$10.05	90 lb. ... 8.40	8.15
IX .. 13.50	12.00	100 lb. ... 8.55	8.30
IXX .. 15.25	13.75	IC ... 8.80	8.55
IXXX .. 17.00	15.50	IX ... 10.00	9.75
IXXXX .. 18.75	17.25	IXX ... 10.95	10.70
		IXXX ... 11.90	11.65
		IXXXX ... 12.85	12.60

## Terne Plates

8-Lb. Coating 14x20

100 lb.	\$8.50
IC	8.65
IX	9.65
Fire door stock	11.50

## Tin

Straits pig	74c to 75c
Bar	85c to 90c
American pig, 99 per cent.	70c to 72c

## Copper

Lake Ingot	18c to 19c
Electrolytic	17c to 18c
Casting	16½c to 17½c

## Spelter and Sheet Zinc

Western spelter	8½c to 9c
Sheet zinc, No. 9 base, casks	12c; open 13c

## Lead and Solder\*

American pig lead	6c to 6¼c
Bar lead	7½c to 8¼c
Solder ½ & ½ guaranteed	45c
No. 1 solder	40c
Refined solder	34c

\*Prices of solder indicated by private brand vary according to composition.

## Babbitt Metal

Best grade, per lb.	90c
Commercial grade, per lb.	50c

## Antimony

Asiatic	8¼c
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## Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	37c to 38c
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## Old Metals

The market is unchanged and very quiet. Dealers' buying prices are nominally as follows:

	Cents Per lb.
Copper, heavy and crucible	13.00
Copper, heavy and wire	12.00
Copper, light and bottoms	10.50
Brass, heavy	8.00
Brass, light	6.00
Heavy machine composition	12.50
No. 1 yellow rod brass turnings	7.25
No. 1 red brass or composition turnings	10.00
Lead, heavy	4.00
Lead, tea	3.25
Zinc	4.25

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5  
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50  
65  
65  
50  
75c  
90c  
72c  
19c  
18c  
1½c  
9c  
13c  
6½c  
8½c  
45c  
40c  
34c  
Record  
.90c  
.50c  
.8½c  
to 39c  
ealens  
Cents  
Per lb.  
13.00  
12.00  
10.50  
8.00  
6.00  
12.50  
7.25  
10.00  
4.00  
3.25  
4.25